30/2

OCCUPATIONAL OUTLOOK QUARTERLY
U.S. Department of Labor
Bureau of Labor Statistics
Summer 1986

ED
REFERENCE C
NEWARK PUBLIC LIBRARY

Improving Job Prospects for College Graduates

Copyright material has been deleted, not available for Microfiche Edition.

U.S. Department of Labor
William E. Brock, Secretary

Bureau of Labor Statistics
Janet L. Norwood, Commissioner

The ***Occupational Outlook Quarterly*** is published four times per year by the Occupational Outlook Service, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212. Second-class postage paid at Washington, D.C., and at additional mailing offices. **Postmaster:** Send address changes to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

For Sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Subscription price $11 domestic, $13.75 foreign; single copy price $3 domestic, $3.75 foreign.

Editor's Note: Articles contributed by authors outside the U.S. Department of Labor do not necessarily represent the views of the Department. Questions on occupational and career information should be sent to Inquiries and Correspondence, Bureau of Labor Statistics, GAO Building, Washington, D.C. 20212. Communications on editorial matters should be addressed to the Editor, Occupational Outlook Quarterly, Bureau of Labor Statistics, Washington, D.C. 20212. Phone: (202) 272-5298.

The Secretary of Labor has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through July 31, 1986.

ISSN 01994786

Bureau of Labor Statistics Regional Offices

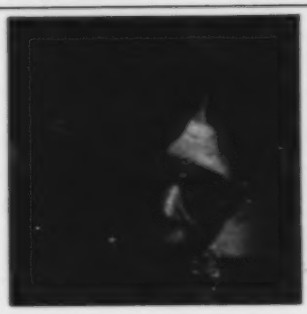
Boston	Suite 1603 John F. Kennedy Federal Bldg. Government Center Boston, Mass. 02203	Phone: (617) 223-6761
New York	Suite 3400 1515 Broadway New York, N.Y. 10036	Phone: (212) 944-3121
Philadelphia	P.O. Box 13309 Philadelphia, Pa. 19101	Phone: (215) 596-1154
Atlanta	1371 Peachtree St. NE. Atlanta, Ga. 30367	Phone: (404) 347-4418
Chicago	9th Floor Federal Office Bldg. 230 South Dearborn St. Chicago, Ill. 60604	Phone: (312) 353-1880
Dallas	Federal Bldg. 525 Griffin St., Room 221 Dallas, Tex. 75202	Phone: (214) 767-6971
Kansas City	911 Walnut St. Kansas City, Mo. 64106	Phone: (816) 374-2481
San Francisco	450 Golden Gate Ave. Box 36017 San Francisco, Calif. 94102	Phone: (415) 556-4678

P.2

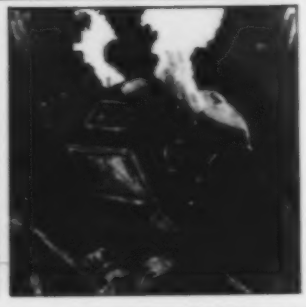
P.

P.18

P.20



P.29



P.34

Cover photograph of Columbia University graduates by Charles Gatewood; copyright, all rights reserved

OCCUPATIONAL OUTLOOK QUARTERLY
Summer 1986
Volume 30, Number 2

Melvin C. Fountain, *editor*
Neale Baxter, *managing editor*
Michael Stanton, *staff writer*
Richard Mathews, *art director*

An Improving Job Market for College Graduates: The 1986 Update of Projections to 1995 — Jon Sargent — 2
The logjam might not be over, but it is beginning to break up, according to this new analysis of the future labor market for college graduates.

The Ph.D. Degree: What It Is and Where It Takes You — Douglas Braddock — 8
The Ph.D., or Doctor of Philosophy, is the highest degree granted in most academic subjects. By the time today's high school students earn one, job prospects are likely to be favorable.

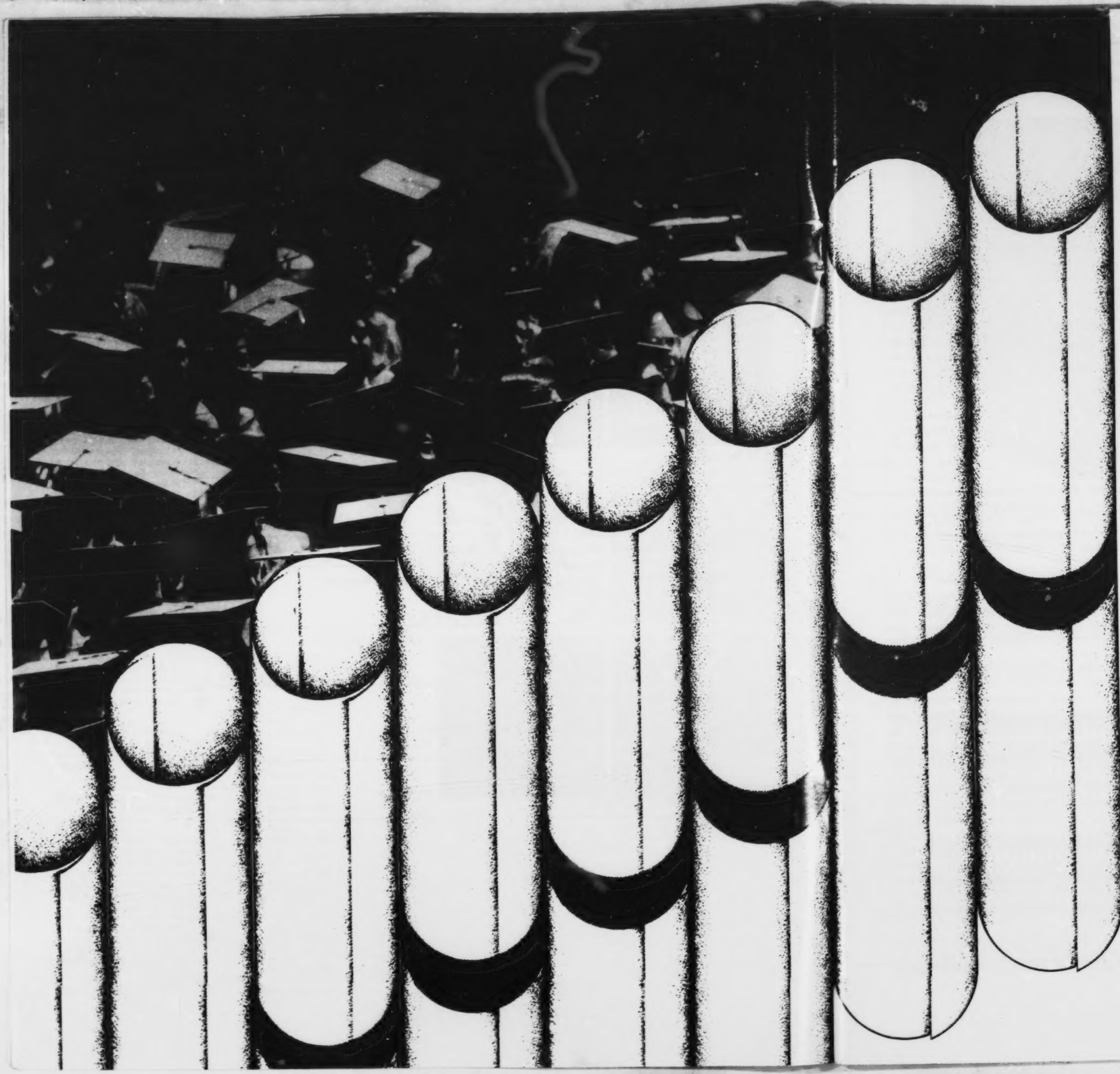
Aid To Be Repaid — 18
People who receive aid to go to college rarely get a free ride, according to a recent study by the American Council on Education summarized here. Part-time jobs and loans that must be paid back account for most of the aid.

Work Around the World — Michael Stanton — 20
"The world," in the words of an old Irish song, "is filled with work to do."

Childcare Workers — Ludmilla Murphy — 29
The large number of parents who must seek work has resulted in plentiful openings for childcare workers.

Career Information in the Classroom — 32
A rich new resource is available for every teacher and counselor who wants to work more career information into the curriculum.

You're a What? Commercial Diver — 34
People who tell Mike Parks to go jump in the lake have to be prepared to pay him.



An Improving Job Market for College Graduates: The 1986 Update of Projections to 1995

by Jon Sargent

The job market for college graduates finally appears to be improving. For more than a decade, keen competition for jobs has been a stressful fact of life for many of the Nation's graduating college seniors. Graduates in a small number of fields were in demand, but large numbers of graduates faced very uncertain job prospects after they received their handshake and diploma. But the latest Bureau of Labor Statistics projections, covering the period from 1984 to 1995, indicate that the keen competition that has characterized the job market for college graduates may ease in the decade ahead, although it will not disappear. About 8 out of every 9 graduates who enter the labor force will find a college-level job.

The improved job market for college graduates over the 1984–95 period will result from a narrowing of the gap between the number of job openings and the number of graduates entering the job market. Projections of these numbers depend on analyses of the current labor force status of college graduates, the sources of openings, the sources of graduates, and other factors.

The College-Educated Labor Force

Despite the difficulty of finding a job in the last decade, 75 percent of the nearly 22.5 million college graduates in the labor force were in occupations that usually require a degree. Of those in jobs usually requiring a degree, more than half were in professional occupations in such fields as engineering, science, and health. About 30 percent held college-level jobs in managerial and management support occupations. About 5 percent were technicians. Another 5 percent were in marketing and sales. The remainder held college-level jobs in a variety of other occupations, such as estimator, investigator, police officer and detective, farm manager, and blue-collar worker supervisor.

Although a small number were unemployed, most of the remaining 25 percent of college graduates in the labor force held jobs that did not require a degree, mainly in service, blue-collar, and administrative support including clerical occupations. Many of these graduates have begun satisfying careers, but others view their present jobs as temporary and expect to transfer in the future into jobs that use their education more fully.

Information on the college-educated labor force clearly shows that the overall surplus of college graduates in recent years did not affect all graduates. Many were able to make a smooth transition from school to work. For example, most graduates who majored in accounting, chemistry, computer science, engineering, mathematics, and nursing who entered the labor force obtained college-level jobs related to their field of study. The effects of the surplus of college graduates were felt much more by graduates in agriculture and natural resources, art, communications, English, and the social sciences.

Jon Sargent is an economist in the Division of Occupational Outlook, BLS.

Job Market for College Graduates

Sources of Job Openings

The demand for college graduates, as measured by the number of openings in jobs that require 4 or more years of college education, arises from several sources: Growth in the number of jobs that traditionally require a college degree; replacement needs (the need to fill the jobs of employed college graduates who leave the labor force); and educational upgrading (the requirement that applicants have more education than was formerly needed for a job).

Over the past decade, the majority of job openings for college graduates has resulted from growth of occupations in which college graduates work. For example, between 1974 and 1984, the employment of electrical and electronic engineers increased about 70 percent, or by more than 200,000 jobs.

Replacement needs stem from the normal attrition of college graduates in the labor force. Every year, some retire, assume full-time family responsibilities, move abroad, or leave the labor force for other reasons. Although only about 1 out of 30 college graduates separates from the labor force yearly, their numbers are substantial due to the size of the college-educated labor force. Many leave the labor force permanently, but others eventually return to the labor force; they comprise a substantial portion of the supply of college graduates seeking jobs.

Educational upgrading occurs when employers seek to hire college graduates for jobs formerly performed by people with less education. In many occupations, skill requirements are becoming more complex, so employers often seek college graduates for jobs once filled by high school graduates. Not all educational upgrading can be attributed to changes in skill requirements, however. Some occurs because employers inflate the education requirement for some jobs when there is an abundance of college graduates looking for work. Employers often hire the best educated individual in a group of otherwise qualified applicants even if the extra education is not really needed. College graduates who fail to find jobs in their chosen field often settle for jobs that have not required a college degree in the past rather than face unemployment. Therefore, determining whether the increase in the proportion of college graduates in some occupations is due to an increase in the skill required or simply to the abundance of college graduates often is difficult. Whatever the cause, educational upgrading is expected to continue.

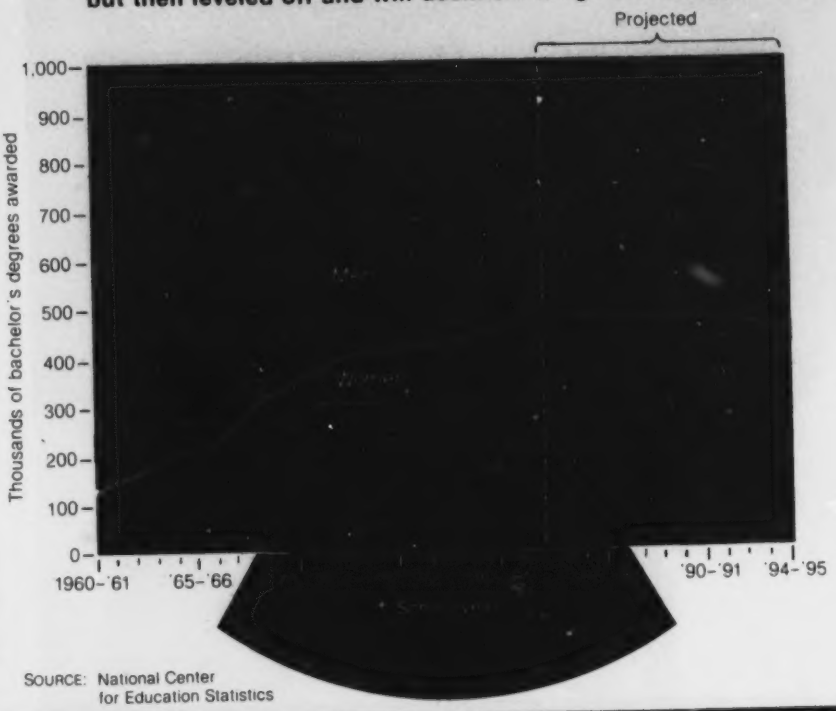
Sources of College Graduates

Additions to the college-educated labor force come from two groups: New graduates and former graduates who are not in the labor force for various reasons.

The number of people who graduate from college each year is a major part of the total number of entrants to the college job market. Between the 1964–65 and 1974–75 school years, the number of bachelor's degrees awarded grew from about 500,000 to more than 920,000 annually, as shown in chart 1. Over the succeeding decade, it continued to increase, but more slowly, reaching 970,000 during 1982–83. Of course, few new graduates are strangers to the world of work. Most have held jobs that did not require a college education. But their new diplomas qualify them to enter a broad range of jobs that formerly were not open to them.

Over the 1984–95 period, the number of bachelor's degrees awarded annually is projected to decline by nearly

Chart 1. **Bachelor degrees awarded increased rapidly until the early 1970's, but then leveled off and will decline through the mid-1990's.**



SOURCE: National Center for Education Statistics

Chart 2. **After increasing between 1973 and 1984, the college age population is projected to decline over the 1984–95 period.**

SOURCE: Bureau of the Census

100,000, according to the National Center for Education Statistics. The changing composition of the population is the cause of the turnaround. Most college students have traditionally been between 18 and 24 years of age, while smaller numbers have been in the 25- to 34-year-old age group. Chart 2 shows that both groups are expected to shrink in the 1984–95 period, after having grown during the preceding 11 years.

Former graduates who are not in the labor force for various reasons make up a growing proportion of the entrants to the college job market. Each year, many members of this group seek college-level jobs. Some seek civilian jobs after serving in the military. Others enter the labor force after having been employed or educated abroad; immigrants are also members of this group, as are many citizens of foreign nations whose jobs dictate that they live and work in the United States. However, the great majority of this group are college graduates who reenter the labor force after having withdrawn earlier to concentrate on child rearing and other family responsibilities or to pursue graduate education. As the college-educated population continues to grow over the 1984–95 period, the number of these other entrants will overtake the declining number of new college graduates entering the labor force. For the first time, new graduates will make up a minority of the entrants.

Projected Job Openings to 1995

Every 2 years, the Bureau of Labor Statistics develops projections of occupational employment and other important factors in the economy. The most recent projections cover the 1984–95 period and provide the foundation for this analysis of job openings for college graduates. Three sets of

Job Market for College Graduates

projections were developed, following different assumptions with regard to such variables as total employment and economic growth. Only one, the moderate trend, is discussed here because the basic changes in the occupational structure of the work force from 1984 to 1995 are similar in all three. The Spring 1986 issue of the *Occupational Outlook Quarterly* contains more information on the projections in general and the occupational projections in particular.

In order to develop the 1995 projected employment in occupations requiring 4 or more years of college education, several different kinds of data were analyzed, including projections of total employment in various occupations, estimates of the proportion of workers in those occupations who need a college degree, replacement needs for particular occupations, and educational upgrading. These new projections, as indicated at the beginning of this article, carry good news for prospective college graduates.

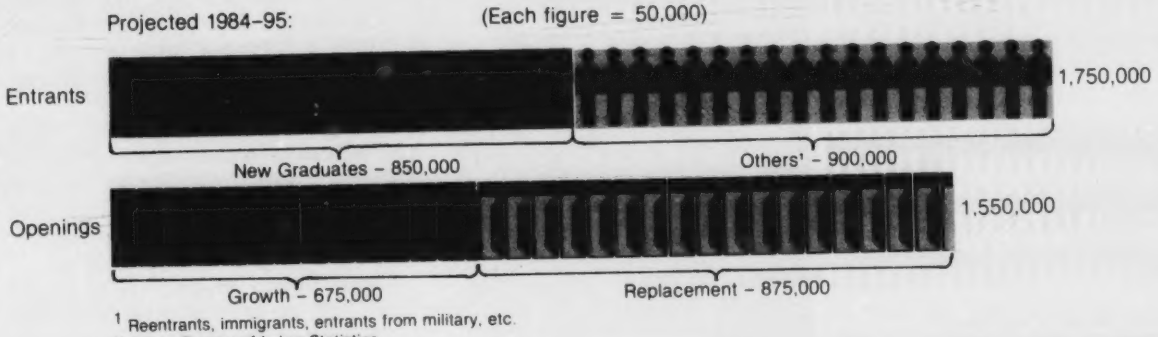
Openings for college graduates are projected to total more than 17 million over the 1984–95 period, or an average of about 1,550,000 each year, as shown in chart 3. The number of jobs that require 4 or more years of college education will increase by 45 percent over the 1984–95 period, three times more than the 15 percent growth projected for all jobs; this growth accounts for about 675,000 of the annual openings. About 875,000 of the annual openings will occur as a result of the need to replace employed college graduates who leave the labor force. The number of such separations will grow during the period because the size of the college-educated labor force will increase.

Growth will vary widely for different

Copyright material has been deleted; not available for Microfiche Edition.

Photo by Charles Gatewood; copyright, all rights reserved

Chart 3. **College graduates entering the labor force through the mid-1990's are expected to exceed job openings that will require a college degree by an average of 200,000 annually.**



[1] Reentrants, immigrants, entrants from military, etc.
SOURCE: Bureau of Labor Statistics

groups of occupations, just as it has in the past. The following indicates the projected growth for the occupational groups in which the largest numbers of college graduates were employed in 1984.

- Jobs in professional occupations requiring a college degree are expected to grow by about a third, with the most rapid growth occurring among engineers, mathematical and computer scientists, and health occupations.
- College-level jobs in executive, administrative, and managerial occupations are expected to increase by more than half over the 1984–95 period.
- Jobs for college-trained technicians are likewise expected to experience an employment gain of well over half.
- Jobs in marketing and sales occupations that require a college degree are expected to grow the most rapidly—doubling by 1995. College-level marketing and sales jobs are concentrated in insurance, real estate, securities and financial services, and other nonretail marketing and sales occupations.
- College-level jobs in administrative support, clerical, service, and blue-collar occupations—although very small in number—are expected to grow by nearly half. Other jobs in these occupations will continue to be a source of employment for college graduates who do not find or choose not to enter jobs requiring a degree.

Projected Entrants to 1995

Over the 1984–95 period, the growing number of reentrants and entrants from sources other than recent graduates is projected to surpass the declining number of new graduate entrants. More than 19 million college graduates are projected to enter the labor force between 1984 and 1995, an average of 1,750,000 a year. About 850,000 of these annual entrants are expected to be new college graduates. Their numbers are projected to decline from the more than 900,000 new graduates who entered the labor force during 1984 to fewer than 825,000 by 1995.

Other entrants, including reentrants, are projected to average about 900,000 annually. Their numbers are projected to increase steadily from fewer than 840,000 in 1984 to more than 1 million by 1995. As a result, the expected decline in annual new graduate entrants over the 1984–95 period should be more than offset by growth of other entrants, producing growth in the overall number of college graduates entering the labor force annually.

Still Some Imbalances

The number of college graduates entering the labor force over the 1984–95 period is projected to continue to exceed the number of openings in jobs requiring 4 or more years of college education. A surplus of about 200,000 entrants annually, on average, or a total of about 2.2 million, is projected over the 1984–95 period. This implies that about 1 entrant out of every 9 will not be able to find a college-level job when entering the job market, in part because currently underemployed and unemployed college graduates will vie with future entrants for college-level jobs. Few of these surplus graduates are likely to face prolonged unemployment, but most will have to take jobs in administrative support, retail sales, service, or blue-collar occupations that do not require a college degree for entry.

This outlook represents a narrowing of the gap between the numbers of entrants and job openings, a gap that has existed for more than a decade. The outlook also represents a narrower gap between entrants and job openings than in past projections of the 1995 labor force developed by the Bureau of Labor Statistics. When the job outlook for college graduates was last assessed, 2 years ago, an average surplus of about 1 out of every 5 entrants was projected over the 1982–95 period—roughly a surplus of 300,000 a year. The more optimistic outlook results from projected increases in employment in jobs traditionally requiring a college degree, educational upgrading, and replacement needs.

Implications

The prospect of a continued surplus of college graduates implies that graduates who enter the labor force over the 1984–95 period cannot be assured that they will be able to enter the occupations of their choice. Some graduates will continue to experience brief periods of unemployment, have to relocate to other areas of the country, scramble for the best available jobs, or job-hop before finding a satisfying position. Nevertheless, most future graduates are expected to find jobs that are challenging and satisfying. In addition, the noneconomic advantages of a college education remain undisputed—opportunities for learning, personal development, and broadening interests.

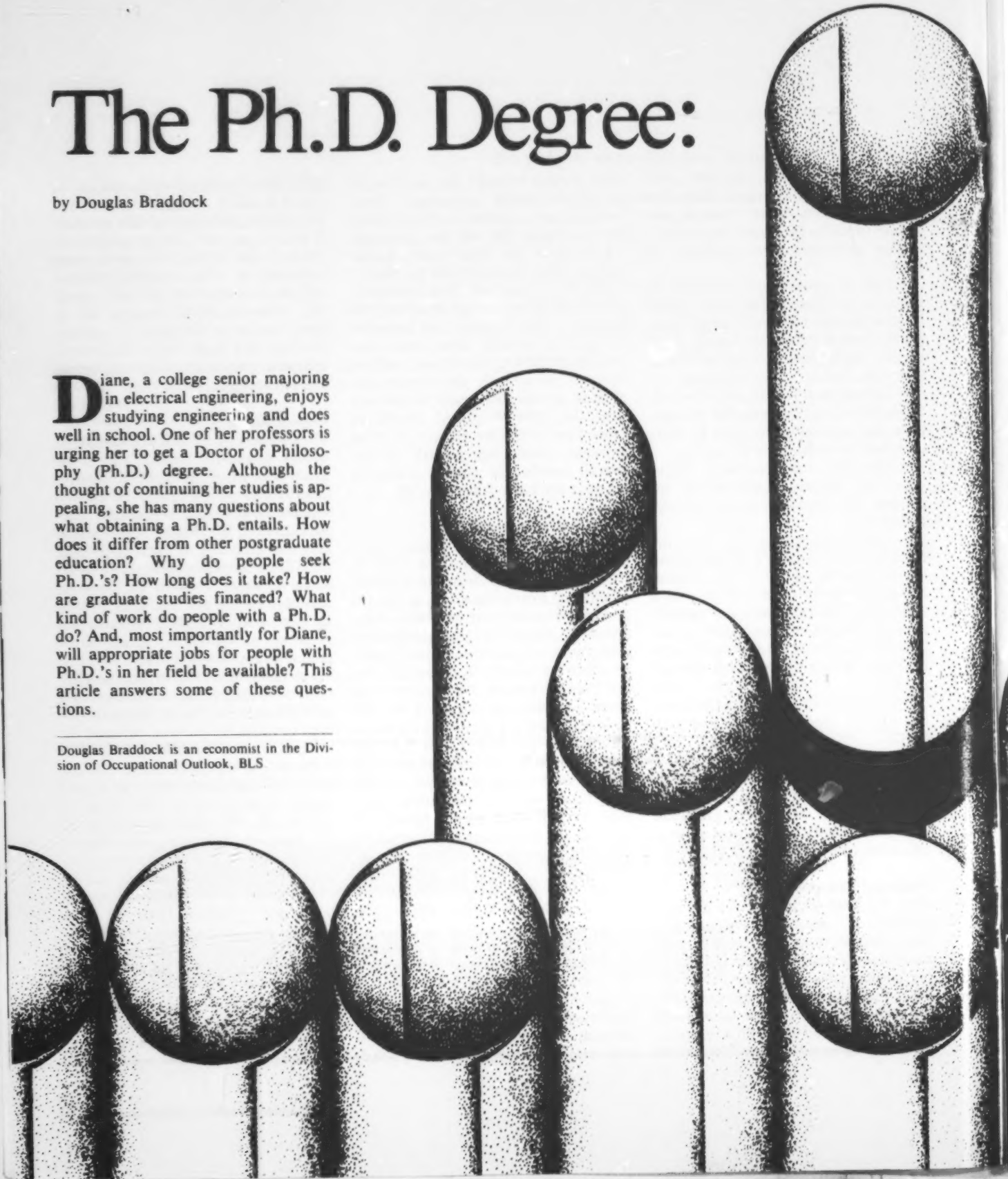
Careful selection of courses of college study and career goals can benefit college graduates when they enter the job market. For more information on job prospects and entry requirements by occupation, consult the 1986–87 *Occupational Outlook Handbook* and the 1986 edition of *Occupational Projections and Training Data.* If these publications are not available at your school or public library, contact the nearest Bureau of Labor Statistics Regional Office for information on how to purchase copies for your own use. (Their addresses are listed on the inside front cover of this publication.)

The Ph.D. Degree:

by Douglas Braddock

Diane, a college senior majoring in electrical engineering, enjoys studying engineering and does well in school. One of her professors is urging her to get a Doctor of Philosophy (Ph.D.) degree. Although the thought of continuing her studies is appealing, she has many questions about what obtaining a Ph.D. entails. How does it differ from other postgraduate education? Why do people seek Ph.D.'s? How long does it take? How are graduate studies financed? What kind of work do people with a Ph.D. do? And, most importantly for Diane, will appropriate jobs for people with Ph.D.'s in her field be available? This article answers some of these questions.

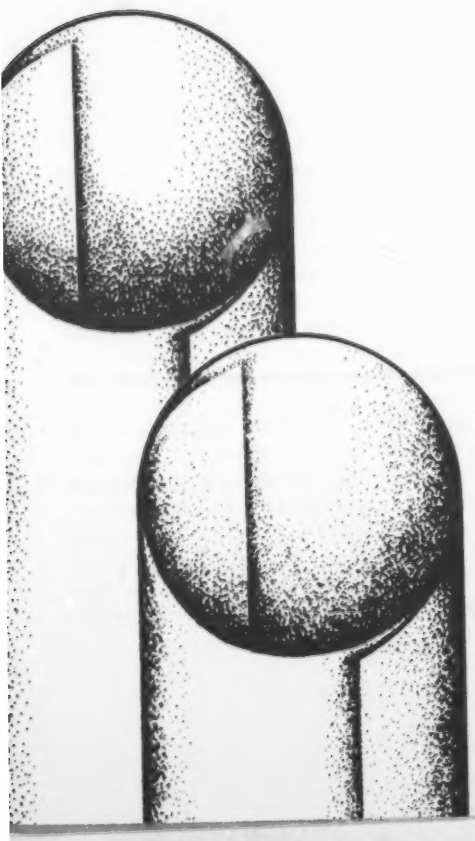
Douglas Braddock is an economist in the Division of Occupational Outlook, BLS



What It Is and Where It Takes You

What Is a Ph.D.?

The Ph.D. is the most common doctoral degree. Although Ph.D. stands for doctor of philosophy, the degree is granted in most academic subjects: Engineering, humanities, life sciences, physical sciences, and social sciences. It is primarily designed to develop research skills, unlike the M.D., for example, which is designed to develop the skills needed by a practitioner. Doctoral degrees are the highest given in academic subjects, although further study beyond the Ph.D., called postdoctoral study, is becoming important in some fields.



The total number of Ph.D.'s awarded in recent years has declined. Almost every discipline has experienced a decline, though some—such as the humanities—have been hit harder than others. Among the few disciplines in which the number of degrees rose between 1973 and 1983 are computer science; earth, atmospheric, and marine science; biological sciences; health sciences; agricultural sciences; psychology; anthropology; music; and communications.

People may have a combination of reasons for obtaining a Ph.D. Many obtain a Ph.D. because it is a prerequisite for some careers—college teaching in particular. Also, in some occupations—physics or mathematics, for example—a Ph.D. is needed to reach full professional status. Other people just enjoy learning about a particular subject. Driven by intellectual curiosity, they want to continue studying the subject and perhaps add to the knowledge of the subject through their own research. Others are motivated to be among the best and to be regarded as a member of an elite learned group. These motivations are so strong that some students in recent years continued to pursue a Ph.D. even though they knew that they would have difficulty finding a job in their field.

In general, obtaining a Ph.D. involves taking 20 or more increasingly specialized courses, conducting research on a very narrow subject, and writing a dissertation that describes the research and its results. The coursework usually takes several years to complete even though it is equivalent to 3 years of academic credit. Classes are usually smaller than undergraduate classes and seminars are common. Typically, students must study articles in scholarly journals as well as textbooks; research papers are usually required. Graduate students have closer contact with their professors and other students in their departments than do undergraduates, but usually have less contact with other parts of university life. They tend to live off campus, are often married, and, in many cases, have jobs or assistantship duties in addition to their studies.

Doctoral students usually specialize in a subfield of their discipline. In physics, for example, the student may concentrate on acoustics; in history, on the American Civil War. However, because a doctoral recipient must have a good knowledge of all aspects of a field, comprehensive examinations on all core or major areas of the discipline must be passed. The nature of these exams—whether oral or written, the se-

quence in which they are taken, the number of times that they may be retaken in case of failure—differs significantly from school to school and from department to department. These exams, together with the requirement that at least a B average be maintained (rather than the C average of the undergraduate school), make doctoral coursework more demanding and challenging than undergraduate courses. Most graduate students gladly spend the additional time required studying and conducting research, however, because the material is so directly related to their major interest.

The dissertation poses a difficult obstacle for many doctoral candidates. The dissertation is a report of original research conducted by the candidate to answer some significant question in the field; it sets forth an original hypothesis or proposes a model and then tests it. In order to test the hypothesis, the student in the sciences or engineering must usually undertake laboratory work, and the student in the humanities must embark on an extensive study of original documents or published material. While conducting the research and preparing the dissertation, the student is guided and advised by a faculty member.

Completing the dissertation usually takes the equivalent of 1 or 2 years of full-time work. The amount of time required varies depending on the candidate's other obligations, the subject of the dissertation, and the diligence of the student. Some students find shifting from the structured environment of classrooms and examinations to the uncertainties of research difficult. As a result, many candidates who have completed their coursework don't complete their dissertation. Colloquially, they are called ABD's (All But Dissertation). Although an ABD is not a degree, many employers view an ABD holder as having a semi-official status between that of a master's degree and doctorate holder.

Table 1. **Years between bachelor's degree and Ph.D., median age, and percent with master's degree for 1983 Ph.D. recipients**

	Median number of years from bachelor's degree to Ph.D.		Median age at which Ph.D. received	Percent with master's degree
	Total time	Registered time		
Total, all fields	9.8	6.6	32.8	80.5
Physics and astronomy	7.2	6.4	29.5	68.0
Chemistry	6.2	5.4	28.6	38.4
Earth, atmospheric, and marine sciences	8.4	6.7	31.1	76.3
Mathematics	7.4	6.1	29.6	74.9
Computer sciences	8.5	6.5	30.9	86.0
Engineering	8.0	5.7	30.8	88.3
Biochemistry	6.9	5.9	29.2	28.0
Other biological sciences	7.6	6.2	30.1	54.2
Health sciences	10.9	6.5	33.9	84.7
Agricultural sciences	8.5	5.8	31.8	90.6
Psychology	8.9	6.6	32.0	80.4
Economics	8.5	6.3	31.3	76.5
Anthropology and sociology	10.7	8.0	34.2	87.0
Political science and international relations	9.9	7.5	33.1	85.0
Other social sciences	10.5	7.0	34.0	90.2
History	11.4	8.5	34.4	90.3
English and American language and literature	10.8	7.8	33.6	88.1
Foreign language and literature	11.3	8.3	34.3	90 3
Other humanities	11.0	7.7	33.8	87.7
Business and management	11.1	6.7	34.4	89.8
Other professional fields	12.7	7.1	36.1	93.5
Education	14.1	7.4	37.8	96.3

Source: National Research Council.

Although a Ph.D. program can be completed in 3 or 4 years of uninterrupted study, it almost always takes longer. For doctorate recipients in 1983 (the latest data available), the median time spent as registered students after receiving a bachelor's degree was 6.6 years (see table 1). However, the time varied by field. Students in the natural sciences and engineering took less time on average than students in other fields. Because few people pursue a doctorate nonstop after leaving college, the median age of those awarded a doctorate was almost 33.

Is a Master's Degree Required?
Contrary to what many believe, a master's degree is not required for entrance into most Ph.D. programs. Although about 80 percent of those awarded a Ph.D. in 1983 had obtained a master's first, some students—especially in chemistry and biochemistry—go directly from the bachelor's degree to the Ph.D. and never receive one.

The master's degree is awarded in its own right. Most are awarded to students who do not intend to go on for their doctorate; however, normal progress toward a Ph.D. usually involves fulfilling the requirements for a master's degree as well. For example, acceptance as a candidate for the doctorate may require completion of a certain number of courses and passing certain tests; completion of these same requirements may warrant the award of the master's degree.

Earning a master's degree might necessitate completing projects that do not contribute directly toward progress in a Ph.D. program, however. For example, a master's thesis representing 500 or more hours of research may be required; while writing a master's thesis is often of general benefit to the student, the content of the thesis may not be useful at later stages of a doctorate program. Therefore, students who are sure they will continue their studies up to the doctorate in the same institution may save time by enrolling in a Ph.D. program at the start rather than first starting out in a master's degree program.

Postdoctoral Study
Although the Ph.D. is the highest academic degree awarded, obtaining it does not necessarily mean the end of one's studies. It has become increasingly common for new Ph.D.'s, especially in the natural sciences, to spend a period of time—often 2 years—doing postdoctoral research and study. Postdoctoral fellows usually perform research, often on a topic of interest to an institution, in return for financial support in the form of a postdoctoral fellowship. In some fields, postdoctoral research is becoming almost a necessity because these areas have become so advanced that the regular doctoral program doesn't afford enough time to become fully knowledgeable about the field and proficient in research. Some recent Ph.D.'s hold postdoctoral positions while they search for a permanent job that suits their interests.

Financial Support
The cost of obtaining a Ph.D. is considerable because of the long period involved. Tuition, housing, travel to a distant university, and child care must be paid for somehow. A substantial cost of graduate education in addition to out-of-pocket expenses is the income that students would have earned had they sought employment immediately after college. Because new employees typically receive fairly rapid promotions and salary increases, the amount of this lost income rises every year the student remains in graduate school.

A complex system of financial assistance has evolved that provides some or

all of the tuition and living expenses for most graduate students. As table 2 shows, the sources of financial assistance vary greatly. Most students rely on a combination of types of financial support, including savings, loans, earnings from part- or full-time jobs, family contributions, and their spouse's earnings. Assistantships and fellowships are the most common sources of income other than earnings.

Assistantships. Basically, an assistantship is a part-time job. The student provides services to the university in return for a small salary and reduction or elimination of tuition. Because the job is in the student's own field, there is some educational benefit to the student from this work. The work experience can also be important when the student seeks full-time employment. There are two kinds of assistantships —teaching and research. The number awarded and the standards for the award vary widely from institution to institution and from department to department.

A teaching assistant teaches one or more courses, usually lower level undergraduate courses. Sometimes, duties are restricted to grading tests or providing tutorial services. Other times, the assistant might conduct the laboratory sessions of a course taught by a professor. In many cases, the assistant has almost all the duties of a regular faculty member, including preparing the syllabus, developing lectures, designing assignments, and evaluating the class's progress. Teaching assistantships are common in most fields.

Research assistants work in laboratories, libraries, or offices, assisting the faculty in performing research. Duties can range from preparing bibliographies to conducting experiments. The availability of these assistantships varies by field; they are common in science and engineering, less common

Table 2. Sources of financial support for 1983 doctorate recipients by field

	Percentage of students receiving support[1]					
	Total[2]	Physical sciences[3]	Engineering	Life sciences	Social science	Humanities
National Science Foundation fellowship and traineeship	2.8	6.7	4.6	3.9	3.0	0.7
National Institutes of Health fellowship and traineeship	6.2	2.2	1.2	21.9	8.7	0.2
Other Federal support	9.2	7.4	8.8	10.2	14.1	9.9
Other national fellowships	3.3	2.5	2.4	3.0	4.3	7.4
University fellowship	19.8	21.3	15.4	18.9	23.9	38.1
Teaching assistantship	46.7	71.1	42.1	41.0	52.3	67.8
Research assistantship	39.1	69.7	69.2	52.1	37.6	13.6
GI bill	4.3	2.4	3.1	2.8	5.1	4.3
National direct student loans	14.4	6.9	4.9	11.2	23.7	20.0
Other loans	12.6	7.3	6.5	10.3	18.7	14.4
Educational funds of industry	3.3	6.0	8.4	2.7	1.6	1.1
Other institutional funds	8.6	5.7	4.6	8.9	9.4	12.4
Own earnings	53.2	27.0	31.1	34.9	60.9	62.6
Spouse's earnings	29.0	20.0	16.0	26.1	31.2	33.4
Family contributions	18.7	14.5	19.3	17.9	24.0	26.7
Other	7.3	5.8	9.7	8.4	6.3	7.7

[1] Rows can add to more than 100 percent because students may receive support from more than one source.
[2] Total includes recipients of professional degrees.
[3] Includes mathematics and computer sciences.

Source: National Research Council.

in social sciences, and relatively rare in the humanities. (See table 2.)

Fellowships. Fellowships are similar to scholarships in undergraduate school in that there are usually no work requirements. Fellowships, which can cover tuition and living expenses, are primarily awarded by universities but are also available from other sources, notably the National Institutes of Health (NIH) and the National Science Foundation (NSF), both of which are Federal agencies. NSF and NIH also award traineeships, which are similar to fellowships except that the funds are not awarded directly to the student but are distributed by the universities. NSF and NIH fellowships and traineeships are concentrated in engineering and the physical, life, and social sciences.

Ph.D. Employment Conditions

Most Ph.D. programs are designed to prepare one for college or university faculty employment by providing a thorough knowledge of a subject and the skills to do research. Until recent years, the major—and, in some fields, almost the only—employers of Ph.D.'s were colleges and universities. Therefore, trends in college enrollments have had an important effect on employment opportunities for Ph.D.'s.

During the 1960's, undergraduate enrollments grew rapidly from 3.6 million in 1960 to 7.9 million in 1970 as the post-World War II baby boom generation reached college age. College enrollments also were inflated during this period by an increase in the percentage of the college-age population who attended college. Growth in enrollments was considerably slower in the 1970's, and it is expected that enrollments will decline beginning in the mid-1980's because of fewer births after the mid-1960's.

The large expansion of college enrollments in the 1960's created a high demand for new faculty. Enrollments in Ph.D. programs responded to this demand, and many of the new bachelor's degree holders who were available continued into graduate school. In addition, Federal and other support for graduate studies increased. However, when growth in enrollments started to slow around 1970, colleges and universities greatly reduced their hiring; and new Ph.D.'s in many fields have had difficulty obtaining permanent academic employment since that time. Natural scientists, partly because of opportunities in industry and government, have had better employment prospects than social scientists and humanities Ph.D.'s, who have historically had fewer opportunities outside colleges and universities. The situation has been different for Ph.D. engineers and computer scientists. They have been in such high demand in industry and other areas in recent years that they have often been lured away from the classroom by much higher salaries in industry. This has resulted in a shortage of college faculty in engineering and computer science even though surpluses existed in other fields.

Life as a Faculty Member

Teaching or conducting research is the primary work activity of most Ph.D.'s (table 3), and more than half work in

Table 3. **Primary work activity by field for 1940–1982 Ph.D.'s, 1983**
(Percent)

	All fields	Mathematics and computer sciences	Physical sciences	Engineering	Life sciences	Social sciences and psychology	Humanities
Teaching	36.2	49.4	21.1	20.8	26.3	40.6	66.3
Research, development, and design	27.7	27.9	44.4	38.7	40.6	14.2	4.4
Management and administration	16.3	12.0	19.6	24.6	15.2	14.4	11.4
Of research and development	—	5.7	14.3	16.2	7.1	2.6	—
Of education or other programs	—	6.2	5.2	8.5	8.1	11.8	—
Consulting and professional services	9.3	5.0	4.2	7.6	7.4	21.3	3.6
Writing and editing	2.6	0.6	1.8	1.2	1.7	3.3	5.1
Marketing, operations, and inspection	2.8	1.5	4.8	4.5	3.5	1.8	—
Other	2.8	0.7	2.0	1.4	2.6	2.4	6.1
Not reported	2.3	2.9	2.0	1.2	2.7	1.9	3.2

Source: National Research Council.

Table 4. **Type of employer by field for 1940–1982 Ph.D.'s, 1983**

	All fields	Mathematics and computer sciences	Physical sciences	Engineering	Life sciences	Social sciences and psychology	Humanities
Number	426,400	21,000	85,000	55,000	87,400	102,500	75,500
Percent:							
Educational institutions	57.6	69.8	39.3	34.9	61.8	60.4	82.9
Business and industry	27.7	22.6	46.5	54.2	19.8	19.6	8.8
Federal Government	6.7	5.0	9.2	7.1	9.5	5.6	2.1
State and local government	2.0	0.2	0.9	0.6	2.3	3.8	1.7
Hospitals and clinics	2.3	0.3	0.8	0.2	3.0	6.1	0.2
Other nonprofit organizations	3.2	1.8	2.9	2.6	3.2	3.7	4.0
Other	0.2	—	—	0.1	0.2	0.7	—
Not reported	0.3	0.4	0.3	0.2	0.3	0.2	0.3

Source: National Research Council.

colleges and universities (table 4). The teaching of undergraduates and course preparation are important parts of faculty members' duties; although 4-year college and university faculty members spent less than half their time in instruction and course preparation (see chart 1), additional time was spent on duties closely related to teaching, such as advising students. These estimates are only averages, of course. Some faculty may spend most of their time doing research, and others—department heads, for example—may devote a considerable amount of time to administration.

Although research consumes less than a fifth of the average faculty member's time, it is typically a very important factor in a faculty member's career. He or she must produce research findings of sufficient quality to be published in scholarly journals. The publication of research results is taken as evidence that the faculty member is staying abreast of and contributing to progress in his or her field and adding to the reputation of the institution. "Publish or perish" is the rule in many institutions.

Many faculty members obtain grants or contracts—often from the Federal Government—to support part or all of their research. In some institutions or academic departments, grants and contracts are an important source of funds. Professors who are able to obtain contracts because of their prominence in a field are highly regarded; their efforts bring greater recognition to the school.

An important part of the traditional academic career is the attainment of tenure. In the traditional academic career, a new Ph.D. is hired with the rank of instructor or, more usually, assistant professor. After a certain period (usually 7 years), the faculty member's teaching record, research projects, and overall contribution to the school are reviewed; tenure is granted if the review is favorable.

Once granted tenure, a professor cannot ordinarily be fired and is likely to continue with that institution for the remainder of his or her career. A faculty member who is denied tenure usually must obtain a job elsewhere. The purpose of tenure is to protect the faculty's academic freedom; that is, it enables the faculty member to teach and conduct research free from the fear of being fired for advocating unpopular ideas. It also gives both faculty members and their institutions the stability needed for effective research and teaching.

In recent years, however, there have been many pressures on higher educational institutions and their faculty that have forced modifications to the traditional faculty career system. As noted earlier, enrollments, which have leveled off, are projected to decline, which will result in lower tuition income. Inflation increased costs faster than tuition and fees could be raised, and Federal and State funds to support higher education were greatly reduced. Government funds supplied 62.5 percent of costs in public 4-year institutions in 1970–71; this was reduced to 57.6 percent in 1981–82. In private 4-year institutions, the reduction was

Chart 1. **Allocations of weekly working hours by faculty members at 4-year institutions**

SOURCE: 1984 Carnegie Foundation Survey of College Faculty, as reported in *Change*, Sept./Oct. 1985.

from 24.9 to 19.9 percent over the same period. Furthermore, a large proportion of most institutions' faculties already have tenure, which compounds these problems. In 1983, 62 percent of science, engineering, and social science faculty and 70 percent of humanities faculty had tenure. Because much of the faculty was hired during the 1960's, the rate of deaths and retirements is relatively low. Therefore, college administrators often find themselves under pressure to reduce costs but have little maneuvering room when some fields—engineering and computer science, for example—become more popular at the expense of other fields, such as English literature or foreign languages. When this happens, tenured staff in the less popular fields cannot be shifted to the more popular ones.

Many of the strategies adopted by colleges and universities to cope with these pressures have had adverse consequences for new Ph.D.'s. The major strategy has been to restrict the hiring of new faculty members, especially in the humanities and social sciences, which has resulted in intense competition in some fields for the few available openings. Colleges and universities have also chosen to create temporary, nontenure-track positions for many of the new faculty members they do hire. Because faculty members holding temporary positions must often leave when their contract expires, many have had a series of temporary jobs at colleges and universities all across the country, becoming what have been called academic nomads.

Another strategy used by colleges and universities to reduce costs is to increase the use of part-time faculty, who usually cost the college less per course taught than full-time faculty. Some part-timers are new Ph.D.'s unable to obtain a tenure-track position. Many others work full time in industry or government jobs and teach a course or two on the side.

Even if a new Ph.D. obtains a satisfactory tenure-track faculty position, a variety of changes in campus life caused by cost pressures and steady or declining enrollments have made the faculty in many institutions less satisfied with their jobs than in the past. Academic salaries have not kept up with inflation, the pressure to produce publishable research results and to obtain research grants and contracts has increased, laboratory equipment has become increasingly out of date, and, in some cases, working conditions have been adversely affected by buildings that are deteriorating due to inadequate maintenance or by students who are unprepared for college-level work.

Opportunities Outside Academia

As table 4 shows, a large proportion of doctoral degree holders do not work in higher education. Although doctoral programs have traditionally concentrated on preparing their students for life as a faculty member, Ph.D.'s in some fields are in demand by employers other than universities. Scientific and engineering research is an essential activity in industry and government, and large proportions of Ph.D.'s in science and engineering have always worked there. Growth in industrial research and development spending since the early 1960's has resulted in more Ph.D.'s than ever who work outside academia.

Many scientists and engineers with doctorates prefer nonacademic work for several reasons. The pay is usually higher—often much higher—in industry than in colleges and universities. Of perhaps more importance to many, industrial research labs often have more up-to-date equipment than universities. Another advantage to those who wish to conduct research is that, in industry, without teaching and administrative duties, one can spend full time on research.

Prior to the early 1970's, many employers in industry and government were reluctant to hire Ph.D.'s in the

social sciences and humanities. It was assumed they would not be satisfied with their jobs and would leave when a faculty vacancy became available. Some new Ph.D.'s, after experiencing the disappointment of being unable to obtain a faculty job, became even more distressed when they found they almost had to hide the fact that they had a Ph.D. when looking for a nonacademic job. However, in recent years, things have changed. Many employers have found that humanities and social science Ph.D.'s are valuable employees. They are bright, are trained in research methods, and have excellent communications skills. Similarly, the attitudes of new Ph.D.'s have also changed. Because many new Ph.D.'s are well aware of the poor prospects of academic employment, they are more receptive to nontraditional types of employment.

What Ph.D.'s Earn

Average annual salaries for Ph.D.'s in 1983 varied considerably by the field of doctorate, from around $30,000 in humanities fields to over $46,000 in engineering. Salaries paid by business and industry were higher than those paid by educational institutions for most fields, but not for the humanities. The salaries in several other occupations can serve for a comparison: Secondary school teachers in public schools earned an average of $21,100 during the 1982–83 school year; experienced engineers, most of whom have a bachelor's or master's degree, earned average salaries of about $36,700 in 1983. Others with at least 3 years of postbaccalaureate training earned more. Experienced salaried lawyers averaged from $40,000 to $50,000 in 1983. The average income of dentists in 1982 was about $55,000 and the average of all physicians' net incomes in 1982 was over $100,000.

Future Employment Opportunities

For at least the next 10 years, employment prospects for college and university faculty, which already are poor in most fields, probably will worsen as college enrollments decline. The number of 18- to 21-year-olds, the age group that traditionally has supplied most undergraduates, is expected to decline over the period because of fewer births after the mid-1960's. Until after the mid-1990's, there are likely to be few tenure-track openings, at least outside of engineering and some of the sciences. In fact, there are fears that lower enrollments might force some colleges to lay off tenured professors, something that has been almost unheard of in the academic world. However, opportunities in business and government for Ph.D.'s in science and engineering fields should be favorable.

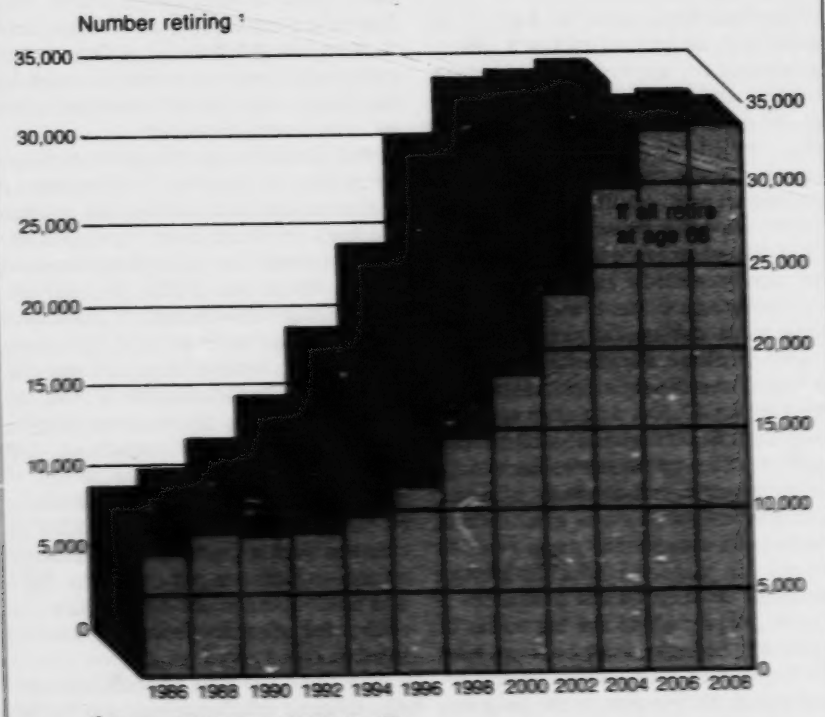
There is some good news over the long term for those presently thinking of pursuing a Ph.D. By the late 1990's, employment conditions for Ph.D.'s should improve. Although this seems like a long time away, the average doctorate recipient earned a bachelor's degree some 10 years earlier. The improvement in employment conditions would therefore take place by the time today's high school seniors become Ph.D. candidates.

Employment prospects for Ph.D.'s are expected to improve in the late 1990's for several reasons. First, the children born to the baby-boom generation will be old enough for college by then; the college-age population and, thus, enrollments, are expected to start to increase from the low point around 1995. Second, demand for people with doctorates is likely to continue to increase in nonacademic areas because of the increasingly higher levels of technology and complexity of industry and government. Third, and perhaps most important, the very large number of college faculty hired during the 1960's will begin retiring by the late 1990's.

Currently, most retiring faculty members were hired before 1960. Faculty members hired during the 1960's will begin retiring in the mid- to late 1990's. This will create a very large number of openings because the number of faculty more than doubled between 1960 and 1970. Chart 2 shows how many Ph.D.'s could be expected to retire assuming differing retirement ages. Conditions may improve sooner in some fields than in others, depending on the age of the faculty, the number of students choosing a field as a major, and nonacademic demand.

Because the employment outlook for Ph.D.'s will vary considerably by field, The *Occupational Outlook Handbook* should be consulted for employment outlook information on specific fields. The *Handbook* will also provide information on the nature of the work, working conditions, and earnings for many occupations that Ph.D.'s enter.

Chart 2. **Projected retirements of Ph.D.'s, 1986–2008**



[1] Assumes Ph.D. was received at age 32.

SOURCE: National Center for Education Statistics

Aid To Be Repaid

The idea that large numbers of students are able to rely on grants and scholarships to pay for a college education may be very appealing, but it has little basis in reality. According to the American Council on Education (ACE), even low-income families that receive aid pay at least half the costs of college attendance. The ACE, which studied the ways families receiving aid paid for college in 1983, also concluded that the kinds of aid received depend very much on whether the school the student attends was public or independent. These and other results from a survey of 15,000 aid recipients at 371 colleges appear in two reports—"How Low-Income Families Pay for College," and "How Middle-Income Families Pay for College," both by Scott E. Miller and Holly Hexter—that were published in July 1985. Some highlights from these reports follow.

Families drew on a variety of resources in order to pay for a college education for their children in 1983. Low-income families—those with adjusted gross incomes below $15,000 per year—relied on a combination of grants, loans, and earnings, while middle-income families—those with annual incomes between $15,000 and $35,000—were more likely to borrow the money needed.

Low-income students and their families paid a substantial portion of the costs of college attendance. At public colleges, the family's real costs averaged about $2,500, and they typically exceeded $4,000 at independent colleges. In order to pay the balance of the student's expenses, a family often relied on a combination of grant, work-study, and scholarship programs. As would be expected, middle-income families that received aid paid an even higher proportion of the real costs of attending college; most paid at least two-thirds and many aid recipients actually pay 100 percent in the long run because they participate only in loan or work-study programs.

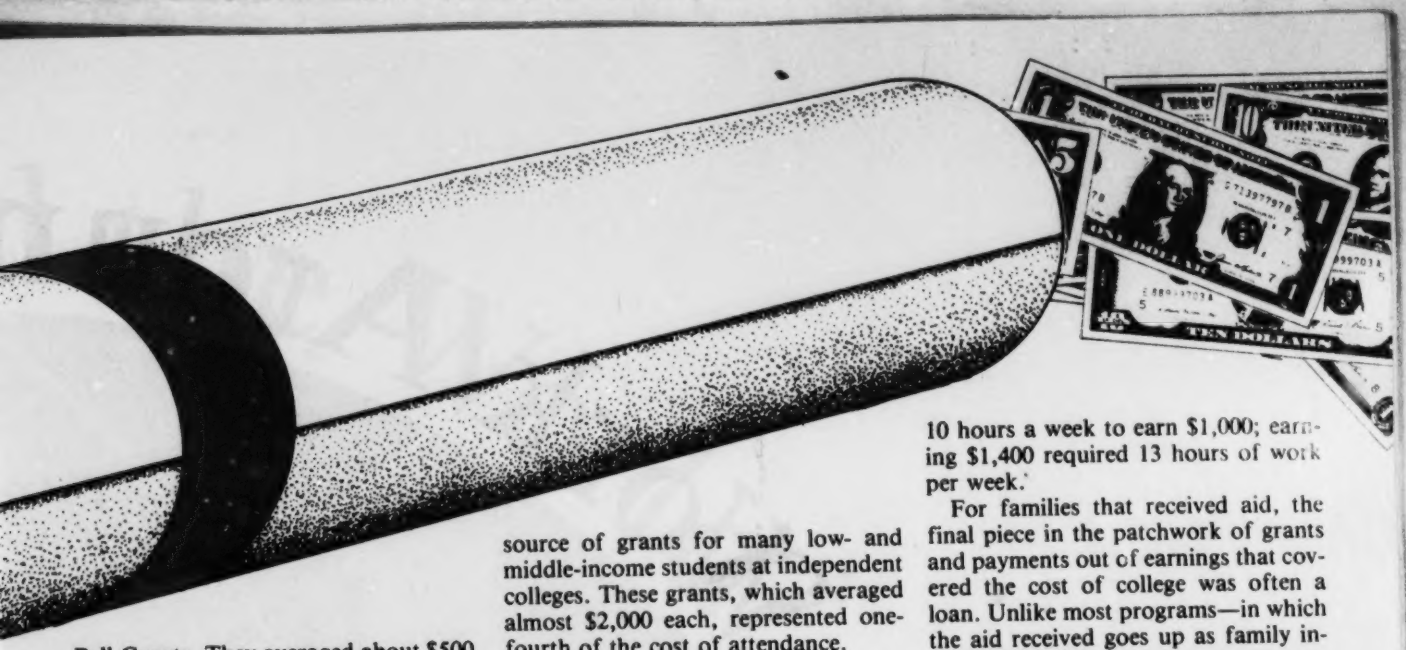
Grants

Students who received aid, especially low-income students, often relied on need-based grants to pay part of the costs of college. The most widely distributed grants came from two Federal programs, Pell Grants and Supplemental Educational Opportunity Grants; however, grants awarded by the States and the schools themselves were also very important.

Pell Grants were the most common form of aid received by low-income students. More than 80 percent of these students received them; most, however, received less than the maximum grant, which was $1,800 in 1983–84. The average low-income student at a public college received a $1,150 grant; students at independent colleges received more, an average of $1,450, because the amount of the grant depends in part on the cost of attendance. The size of a Pell Grant falls as family income rises. As a result, only one family in three with earnings above $25,000 received such a grant, and the average award—which ranged between $623 and $947—was much lower than the award for students from low-income families.

Supplemental Educational Opportunity Grants, which are paid for by the Federal Government but distributed by the school, were much smaller than

This article is based on two publications of the American Council on Education: "How Low-Income Families Pay for College" and "How Middle-Income Families Pay for College," both by Scott E. Miller and Holly Hexter, two members of the Council's staff. The studies were published in July 1985. Copies are available from the Division of Policy Analysis and Research, American Council on Education, One Dupont Circle NW., Washington, D.C. 20036-1193. Price: $5 for members of the Council, $8 for nonmembers; payment and a self-addressed mailing label must accompany the order. This summary was prepared by Neale Baxter, managing editor of the OOQ.



Pell Grants. They averaged about $500 for the 24 percent of low-income public college students who received them and $800 for the 30 percent of independent school students who did. The average award for a student from a middle-income family was roughly the same as that for low-income students ($575 at public colleges and just under $800 at independent ones); but the percentage of recipients was somewhat lower, being 20 percent at public schools and 25 percent at independent ones. Although these awards were small, they nevertheless reduced the low- or middle-income family's costs by as much as 10 percent.

Grants provided by the States made a major difference in the real cost the family paid. More than 40 percent of the low-income aid recipients at public colleges received an average of $675 in State grants; and more than 60 percent of those at independent colleges received a State grant averaging $1,675. Students from middle-income families received these grants in about the same proportion and amounts as the low-income students. About one-third of the middle-income recipients at public colleges were awarded an average of $550; more than 50 percent of the middle-income recipients at independent colleges were awarded an average of nearly $1,500. Like Pell Grants, these awards are tied to the family's income; awards were much less common for families that earned more than $25,000 a year than for families that earned less.

The schools themselves were a third source of grants for many low- and middle-income students at independent colleges. These grants, which averaged almost $2,000 each, represented one-fourth of the cost of attendance.

Work-Study and Loans

All the grant money awarded by schools and governments combined did not pay the full cost—or even half the cost—of school for most low- or middle-income students that received aid. The balance had to be paid from family contributions, including loans and the student's earnings. Federal campus-based programs—National Direct Student Loans, College Work-Study, and Guaranteed Student Loans—provided sources for these contributions. Many aid recipients received support from at least one of these programs.

The work-study program was especially important to these students. Awards averaged more than $1,000 for the 30 percent of low-income students at public colleges who were in the program; and awards averaged $1,400 for the 41 percent of low-income students at public colleges who were in the program. Among middle-income students, these programs are equally important. About 25 percent of these students in public colleges and about 45 percent of those in independent colleges participated in a work-study program. In both cases, the student's earnings averaged $1,000.

Students receiving College Work-Study awards usually worked for the minimum wage at jobs on their college campus, although many worked off-campus for nonprofit organizations, such as hospitals. During a 30-week academic year, a student had to work 10 hours a week to earn $1,000; earning $1,400 required 13 hours of work per week.

For families that received aid, the final piece in the patchwork of grants and payments out of earnings that covered the cost of college was often a loan. Unlike most programs—in which the aid received goes up as family income goes down—loan programs were relied on more as a family's income rose. About one-third of the middle-income aid recipients at public colleges participated only in this program; in effect, the family was responsible for 100 percent of the student's expenses.

About one-quarter of low-income aid recipients at public colleges took out a Guaranteed Student Loan; about 60 percent of those at independent colleges did. The average loan was $1,850 for public college students and $2,250 for those at the independent schools. Borrowing was even more common for middle-income families. At public colleges, more than 40 percent of these students borrowed an average of $2,100 a year for school. At independent schools, almost 75 percent of the middle-income aid recipients took out Guaranteed Student Loans, and the average loan was just $200 shy of the $2,500 maximum; based on these figures, these students will graduate with a debt of $9,200, requiring payments of more than $120 a month for 10 years.

Despite all these programs, a student's ability to attend college depended on the family's income. The proportion of full-time, low-income students in the Nation's colleges was much lower than the proportion of low-income families in the population. In 1983, almost 40 percent of the population lived in families with an income under $20,000 a year; less than 25 percent of the full-time students came from such families. OOQ

Work Around the World

by Michael Stanton

What image occurs to you when you think of an international career? For many, the notion undoubtedly prompts pictures of exciting jobs in exotic places. Some people might envision a pin-striped diplomat globe-trotting from the Middle East to the South Pacific to resolve international crises. Others might imagine an engineer supervising a construction project in Brazil's lush Amazonian jungle. Or your mind's eye might place you before a dark mahogany table in the Netherlands, negotiating a deal with the moneymen of The Hague.

Now set your imagination aside and open your eyes. This trio of travelers is an invention. Few positions abroad offer prospects of glamour, high pay, and prestige. Working overseas demands hard work and sacrifice. Yet, for multitudes of Americans, such jobs are not fantasy but fact. Spanning the globe from Albania to Zimbabwe, from the edge of the Canadian arctic to the tip of Tierra del Fuego and beyond, you can find Americans working. Government workers and diplomats, teachers and traders, computer specialists and construction bosses, and many others, have chosen the challenges and rewards of living and working overseas.

The rewards can be substantial, but not necessarily in dollars or pesos or pounds. Many will say that the principal compensation is the wealth of experience that comes from the exposure to new ideas and the currency of confidence that results from adapting to different ways of living.

To gain these rewards, you have to confront the challenges. And the first challenge is finding a job. Job hunting is always difficult, but conducting a search across international borders multiplies the complications. There are no hard and fast rules to finding a job overseas. But it helps if you know who the players are and what they look for in prospective employees.

Opportunities exist in several sectors, such as government; business; multinational organizations like the United Nations; and private organizations like CARE, Inc. This article examines the opportunities in each sector and the job skills most widely sought. Sources of additional information about particular agencies and organizations appear in the text; an accompanying box indicates more general sources of information.

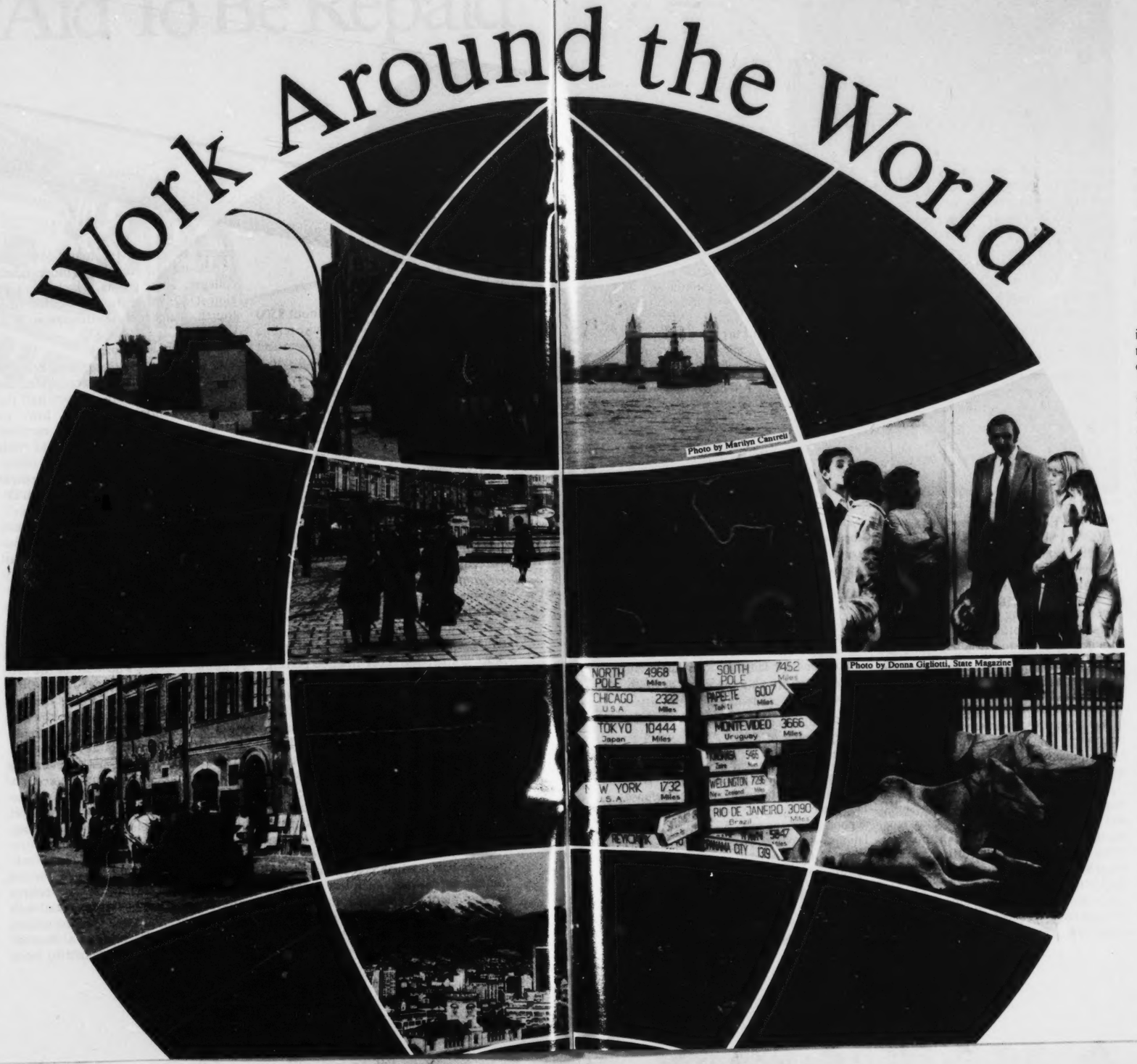


Photo by Marilyn Cantrell
Photo by Donna Gigliotti, State Magazine
NORTH POLE 4968 Miles
CHICAGO 2322 Miles U.S.A.
TOKYO 10444 Miles Japan
SOUTH POLE 7452 Miles
PAPEETE 6007 Miles Tahiti
MONTEVIDEO 3666 Miles Uruguay
WELLINGTON 7236 Miles New Zealand
RIO DE JANEIRO 3090 Miles Brazil

Federal Government

Within the last few decades, the world has grown more complex and, in a sense, smaller. Technological advances in transportation and communications have brought distant parts of the world closer together, increasing the points of contact between nations. Trade, cooperative projects linking international organizations, and tourism have all grown. But the fulcrum upon which international relations are balanced remains the United States Government.

The largest employer of Americans

Michael Stanton is the OOQ's staff writer.

overseas, the Federal Government offers at least a couple of advantages to the jobseeker that the other international employers do not. Federal agencies adhere to clearly defined standards when hiring, promoting, and paying employees. Additionally, entry level junior officers can generally expect an overseas assignment within a year of their appointment.

On the other side of the coin, Federal salaries often lag behind those in the private sector. Furthermore, Federal employees must pay Federal taxes, while Americans working overseas with private companies and international organizations are exempt from Federal taxation on a large portion of their salaries.

Although most major Federal agencies and departments maintain a bureau or office with international interests, the conduct of the Nation's foreign affairs is principally the province of a handful of organizations. Chief among these is the Department of State, which, through the career professionals of the Foreign Service, runs our embassies and consulates in nearly every country of the globe.

The Department of Defense, which is responsible for providing military forces for United States security, is the largest employer of Americans abroad as well as here at home. The Agency for International Development (AID) serves as the principal conduit for development assistance and economic aid. And the United States Information Agency (USIA) conducts educational and cultural exchange programs and is the international communications arm of the U.S. Government.

Two other cabinet departments, the Department of Agriculture and the Department of Commerce, each maintain a small corps of Foreign Service professionals who serve in overseas missions.

Department of State. The primary actor in U.S. foreign affairs is the Department of State. Approximately 4,000 Foreign Service officers are stationed in 230 embassies and consulates around the world. Most enter the Service by passing the Foreign Service Examination. Administered every year in December, this rigorous exam tests communications skills and general knowledge of public and international affairs.

As a whole, the exam is structured to measure a candidate's aptitude in the State Department's four career areas, or cones: Administration; consular affairs; economic and commercial affairs; and political affairs. About 20,000 people take the test annually. However, only an average of 10 percent score high enough to be eligible to sit for the oral exam, a grueling all-day session that encompasses a variety of exercises.

Administrative officers manage the support operations of the embassy; within this cone are five principal categories: Budget and fiscal, personnel, security, communications, and general services. Consular officers have frequent contact with the public. They grant visas, issue passports, and answer questions concerning U.S. citizenship. They also provide emergency assistance to Americans traveling overseas. Economic and commercial officers represent U.S. commercial interests in foreign countries; they gather and interpret economic data and assist U.S. businesses in gaining access to foreign markets. Political officers fill some of the most sensitive positions in our embassies; their reports and interpretations of international political events directly affect U.S. foreign policy decisions.

The first months of service are spent in orientation and training in job skills and language. The first overseas assignment of 18 to 24 months is typically spent serving as consular officer, working with people seeking to immigrate to the United States.

Career development is closely monitored at the State Department. Junior officers enter the service as Foreign Service Reserve Officers and only pass to career status after a formal tenuring process.

A spokesperson in State's Office of Recruitment says that "no one single way exists to prepare for a foreign service career. A solid liberal arts background offers the best foundation, and good communications skills are a definite asset."

Information on the Foreign Service Examination and careers in the Foreign Service can be obtained from

Board of Examiners for the Foreign Service
Box 9317
Rosslyn Station
Arlington, Virginia 22209.

The State Department offers a limited number of overseas employment opportunities outside the Foreign Service. Known as Foreign Service Specialists, these employees include communications specialists, secretaries, engineers, physicians, and nurses. For information, write

Employment Information Office
Department of State
Room 2815
Washington, D.C. 20520.

Positions for language translators and interpreters are also available at State. Write

Language Service Division
Department of State
Washington, D.C. 20520.

Department of Defense. Most overseas civilian employees of the Defense Department serve in administrative and support positions at U.S. military installations. A special program, the Department of Defense Automated Overseas Employment Referral Program (DOD AOERP), serves as a central registry of individuals interested in overseas employment. To get on the registry, however, you must be a Federal employee or

have civil services status. If you meet these basic qualifications and are interested in registering, contact the civilian personnel office at any Defense installation.

The Department includes agencies that are major components of the U.S. intelligence community. For information on its role in this area, see the Winter 1984 issue of the OOQ.

Teaching opportunities in the Department's overseas school system are covered later in this article.

United States Information Agency. Foreign Service Officers also serve with the United States Information Agency (USIA). Successful completion of the Foreign Service Exam is the normal mode of entry. Two classes a year of new Foreign Service Officers enter USIA.

Foreign Service Officers at USIA usually find their job duties place them in one of two categories: Information officer or cultural affairs officer. Information officers are responsible for media relations and deal daily with the press. An information officer usually serves as the embassy's daily spokesperson. Cultural affairs officers manage the many exchange and educational programs sponsored by the U.S. Government.

Not all of the employees of USIA are Foreign Service Officers. As an international information organization, the agency maintains an array of radio, television, film, and publications services. It employs broadcast technicians, producers, writers, editors, and support personnel to staff these programs.

An independent arm of USIA, the Voice of America, is an international radio network that broadcasts in 47 different languages and employs several thousand people worldwide. Employees fall into three general categories—engineering technicians, broadcasters and producers, and support staff.

The Voice of America maintains an intern program that accepts a small number of candidates twice a year. According to Carol Cooper, coordinator of the program, interested candidates must submit a Standard Form 171 accompanied by writing and voice samples. Candidates then pass through several stages of selection, including testing and interviews.

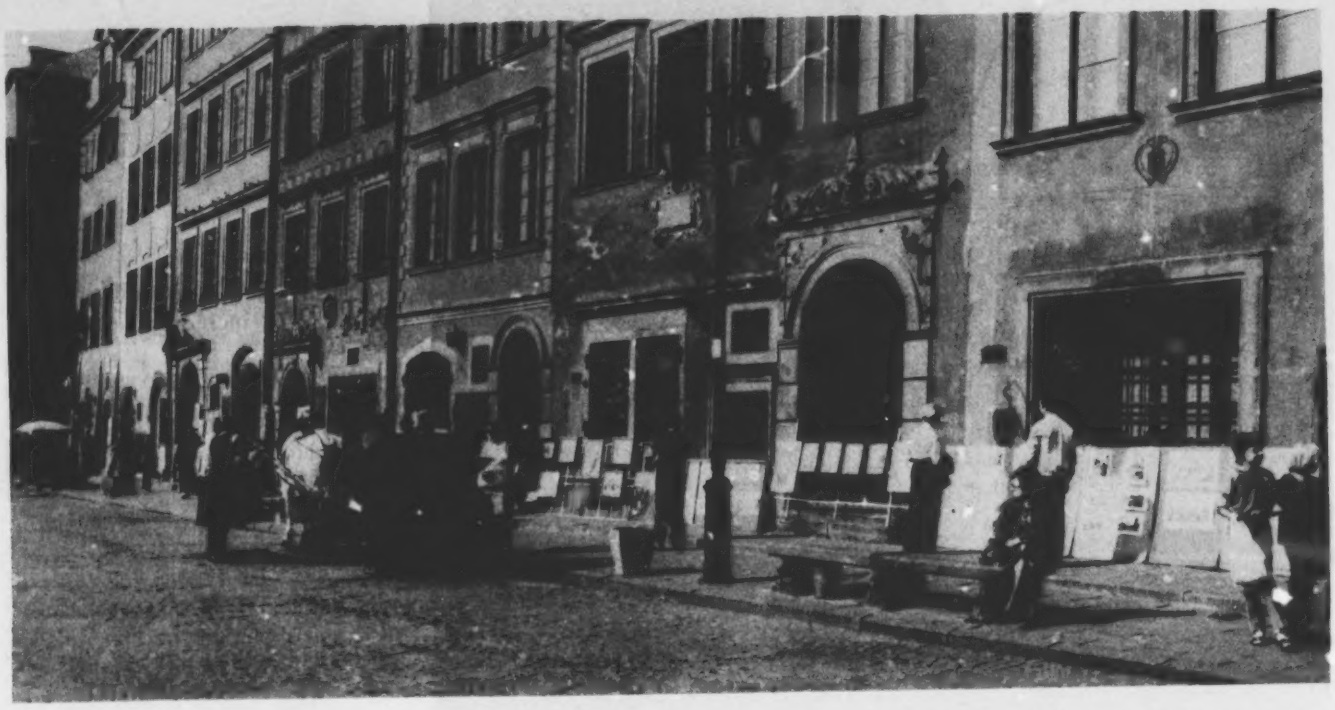
Interns work for 2 years in the Voice of America headquarters in Washington. The first year is a highly structured progression through a series of 6- to 8-week assignments in such areas as production, writing, and editing. In the second year, assignments are usually concentrated in one area to prepare the intern for a career position with the Voice of America. This transition is not guaranteed, however. All positions with the Voice of America are competitive. For more information, write

VOA Intern Guide
Office of Personnel
330 Independence Avenue SW.
Washington, D.C. 20547.

Agency for International Development. Most of the U.S. programs for development and economic assistance abroad are administered by the Agency for International Development (AID). From its headquarters in Washington and about 60 overseas missions, it manages programs in such areas as rural development, health, water and sanitation, education, and agriculture.

Unlike the State Department's Foreign Service, AID hires only a small number of entry level professionals each year. Nearly all of these come from its International Development Intern Program. Two classes a year of approximately 25 interns are chosen from nearly 3,000 candidates. Typically, a successful candidate has a graduate degree in such fields as public health, agricultural economics, and urban or rural development. Most candidates are fluent in at least one foreign language.

After an orientation period and a series of temporary assignments in the Agency's headquarters, an intern is usually posted overseas for a 2-year tour. Assignment to the Agency's perma-



nent staff follows completion of the internship.

The booklet *Opportunities Overseas* describes the intern program in detail. It can be obtained by writing

International Development Intern Program
Office of Personnel
AID
Washington, D.C. 20523.

Department of Commerce. International trade is a hot topic. The U.S. international trade balance has been running in the red the last few years and the deficits continue to grow. The United States and Foreign Commercial Service was founded in 1980 to redress this imbalance and enhance U.S. trading efforts overseas.

The United States is the world's principal economic power, yet only a small percentage of U.S. businesses actively participate in international trade. About 1 percent of American business generates 80 percent of U.S. exports. The Service seeks to increase U.S. participation in international markets, particularly among small and medium size businesses, through educational and informational programs here at home and aggressive promotion overseas.

Domestically, the Service maintains 47 district offices across the Nation. Overseas, about 180 foreign service officers work in 68 embassies.

The Commerce Department maintains its own Foreign Service Personnel Office, but it selects its officers from the register of candidates who have passed the Foreign Service examination of the Department of State. A spokesperson for the Commerce Department says that most candidates have a graduate degree, frequently in international business or marketing. Additionally, most have a minimum of 2 years' experience in international trade.

For more information, write

Office of Foreign Service Personnel
Room 3226
Department of Commerce
Washington, D.C. 20230.

See also the March 5, 1984 issues of *Business America* for a profile of the USFCS.

Department of Agriculture. Just as the Foreign Commercial Service of the Department of Commerce promotes U.S. business abroad, the Foreign Agricultural Service of the Department of Agriculture promotes trade in agricultural products.

The Service has a staff of about 500, including 300 Agricultural Attaches in our embassies overseas. The Service gathers agricultural intelligence and trade data and shares this information with the agricultural community here in the United States. Professionals in the Service usually have a master's degree with an emphasis in agricultural economics.

For information on employment opportunities, write

Foreign Agricultural Service
Personnel Division
Room 5627 South
Department of Agriculture
Washington, D.C. 20250.

The Service also publishes an array of information on all aspects of international agricultural trade. For a listing of these publications, write

Foreign Agricultural Service
Information Division
Room 4644 South
Department of Agriculture
Washington, D.C. 20250.

Opportunities in Businesses

Thousands of American corporations and companies do business overseas. Each follows its own employment practices and policies. To find out what these are, you'll have to do some research. But

some general observations can be made concerning business careers overseas that may prove helpful to the international jobseeker.

Competition for jobs overseas in business is very keen. It comes not only from Americans but, increasingly, from citizens of the country in which a business's operations are located. U.S. companies are projecting a more local image abroad by hiring qualified host country nationals. And the pool of capable people is growing.

The essence of business is sales and marketing. People skilled in these areas find many doors open to them because the same principles apply whether a firm produces microcomputers or designer jeans. A business's success in sales and marketing shows up on the bottom line. So does its effectiveness in managing financial resources; therefore, a background in accounting or finance can boost a career.

No matter how strong your skills, be aware of one thing: Rarely does a business send an untested employee overseas. A demonstrated record of accomplishment is essential. If you're interested in a business career overseas, expect to spend several years here at home learning the ropes.

Companies look for applicants with multiple talents. Besides having business-related skills such as marketing and accounting, language skills and overseas experience, perhaps with an organization like the Peace Corps, can help you compete more effectively. Maintaining an employee overseas represents a considerable investment to a company; the cost can exceed $100,000 per employee, according to Mr. Will Cantrell, editor and publisher of *International Employment Hotline*, a clearinghouse for overseas job opportunities. This sum includes much more than salary and benefits. A company must calculate the cost of selection, orientation, travel allowances, and transportation for the employee, family members, and household effects. No wonder firms want people who can adapt to the demands of living in another country and culture. For more information about business opportunities overseas, see the publications listed in the accompanying box.

International Organizations

During the post-World War II era, the world has witnessed the growth of many multinational organizations, such as the United Nations and the Pan American Health Organization.

These organizations recruit similar kinds of employees. They seek people with graduate degrees and substantial professional experience. A practice these organizations share is that workers are drawn from each member nation. Quota systems, based on either financial contributions to the organization or geographical distribution, are common. Competition for these positions is very keen.

Several organizations, such as the World Bank and the International Monetary Fund, operate programs designed to attract qualified young professionals to their staffs. Similar to AID's International Development Intern Program, these programs are highly competitive and accept only a small percentage of applicants. To be considered, an applicant must have a graduate degree and substantive international experience.

Private Organizations and Foundations

An increasing role in international affairs is being played by nonprofit or private voluntary organizations and foundations, which are as varied as their members are plentiful. They include organizations that provide development aid and economic assistance, such as CARE, Inc., groups that sponsor cultural and educational exchanges, such as American Friends Service International; and organizations that fund major projects, such as the Ford Foundation.

These organizations offer many entry level jobs, but generally use the same criteria employed by the other actors on the international scene—expertise, education, and linguistic proficiency.

Private voluntary organizations usually pay more modest salaries than other international employers. But money is generally not the prime motivator for those who work with nonprofit groups. Service is. However, as one advances within these organizations, salaries for experienced workers generally approach parity with the other sectors.

Work Around the World

Opportunities for Overseas Experience
Many young people get a leg up on an overseas career through their participation in international exchange and education programs and internships. Numerous sponsoring organizations offer the chance to sample what life is like beyond our borders.

The American Friends Service Committee sponsors summer-long programs in Latin America where young people participate in development projects with youths from other nations.

Youth for Understanding coordinates exchange programs for high school students, bringing foreign students to the United States to live with American families. U.S. students participate in a similar fashion overseas.

The International Association for the Exchange of Students for Technical Experience (IAESTE) sponsors short-term internships for students for careers in engineering, architecture, and the physical sciences.

Peace Corps: A Unique Opportunity. This year marks the 25th anniversary of the Peace Corps. Since 1961, more than 100,000 men and women have served around the globe as Peace Corps volunteers. Today, over 5,000 volunteers are at work in 60 countries in Latin America, the Caribbean, Africa, Asia, and the South Pacific.

These volunteers work primarily in agriculture, rural development, health, and education. Within each of these broad sectors is a plethora of projects and programs. Health volunteers in Paraguay train midwives in techniques aimed at reducing a dangerously high infant mortality rate. In the Arab Republic of Yemen, teams of architects and skilled trades workers are rebuilding communities devastated by earthquakes. Fisheries specialists in the Solomon Islands are helping islanders to develop fishing industries from subsistence level operations.

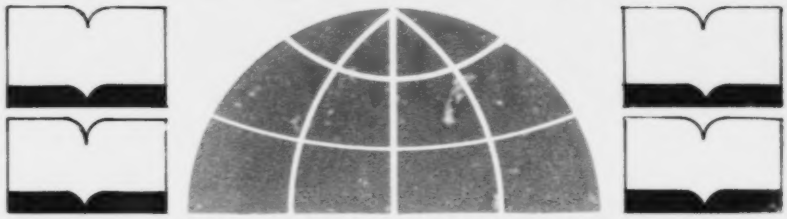
The Peace Corps actively recruits people with particular skills for specific projects. But many volunteers, about 30 percent, come to it with no specific skills or work experience. These generalists are trained and placed in such projects as health education and forestry extension.

All volunteers participate in an intensive 12- to 14-week training program. This 3-month program is devoted to language studies, job training, and cross-cultural education. Major emphasis is placed upon the development of basic fluency in a language. Instruction is offered not only in major languages such as Spanish, French, and Arabic, but also in such languages as Tagalog for those volunteers in the Philippines and Swahili for those serving in some African nations. Training continues outside class. Most volunteers live with a host-country family during training, so their immersion in a new country and new culture is near complete.

The normal term of a volunteer's service is 2 years. All volunteers receive a monthly living allowance which, though very modest by U.S. standards, is more than sufficient to provide a comfortable lifestyle. Complete medical care is also part of the volunteer package, as well as 24 days of vacation per year. Upon completion of service, a sum equal to $175 per month of service is given to each volunteer.

As a springboard to an international career, Peace Corps service can be a valuable asset. Few other opportunities of-

Some Additional Sources of Information



Besides the particular sources of information listed in the article, many more general guides to overseas employment are published, including the following.

The International Division of the U.S. Chamber of Commerce offers several publications of interest to the international jobseeker. *Employment Abroad: Facts and Fallacies* offers general information on international employment. The latest edition was published in the fall of 1985 and costs $4.

A related publication from the Chamber of Commerce is the *Foreign Commerce Handbook: Reference Works*. This book is a thorough primer on international trade. It examines the roles played by public, private, and international organizations in international commerce. One especially helpful chapter, entitled "The Daily Language of Foreign Commerce," is a handy glossary of terms frequently used in the international marketplace. A bibliography is included. The cost is $10. For information on these and other publications, write

U.S. Chamber of Commerce
International Division
1615 H Street NW.
Washington, D.C. 20062.

Manufacturers, banks, consulting firms, construction companies, and many other kinds of businesses have international operations. One of the most complete guides to these companies is the *Directory of American Firms Operating in Foreign Countries*, published by the World Trade Academy Press. The 10th edition of this three-volume work, published in 1984, lists more than 3,200 companies which do business in 121 countries. Entries briefly describe each company and list its domestic and foreign addresses. This publication is available in most libraries; ask the reference librarian.

The primary reference book on private voluntary organizations is *U.S. Non-Profit Organizations in Development Assistance Abroad*, available from Technical Assistance Information Clearinghouse. Commonly called the TAICH Directory, this book contains information on more than 400 organizations with overseas interests. Check your local library for a copy.

Most major international organizations publish monthly operational summaries of contracts for bid and projects undertaken. The nature of the contract can indicate the kinds of workers being sought. Contact the individual agencies for information. One source of information on contracts with the U.S. Government is the *Commerce Business Daily*, published by the Department of Commerce. It is available through subscription. Write

Superintendent of Documents
Government Printing Office
Washington, D.C. 20402
(202) 783-3238.

The Agency for International Development also publishes information on new contracts. The bulletin, *Current Technical Service Contracts and Grants*, is commonly called "AID Contracts." Write

AID
Office of Contracts Management
Washington, D.C. 20523.

If you'd like to harvest grapes in Italy, sift the sands in the Middle East for archaeological relics, or participate in vaccination programs in Latin America, there are organizations that can help you to do so. They're too numerous to list here, but you can find them in *The Whole World Handbook*, published by the Council on International Educational Exchange. The Council is a storehouse of information on overseas opportunities. For more than 10 years, it has sponsored its own work-abroad programs in Great Britain, Ireland, New Zealand, and Germany. It even arranges for overseas work permits for program participants, which are very difficult to obtain. *The Whole World Handbook* costs $6.95. To obtain it and information on other Council programs, write

Council on International
Educational Exchange
Publications Office
205 East 42nd Street
New York, N.Y. 10017.

Many other publications offer advice on overseas jobs in general or employers in particular. The following are among the books available. *Looking for Employment in Foreign Countries*. A companion guide to *Directory of American Firms Operating in Foreign Countries*, it is also published by the World Trade Academy Press. The 7th edition was published in 1985.

World Trade Academy Press
50 East 42nd Street
New York, N.Y. 10017
Price: $16.50.

Careers in International Affairs
School of Foreign Service
Georgetown University
Washington, D.C. 20057
Price: $10 plus $1 postage and handling.

For information on international current overseas employment opportunities, an excellent source is

International Employment Hotline
P.O. Box 6170
McLean, Va. 22160
Price: $28 for 1-year subscription (12 issues).

Work Around the World

Inside Advice

"The international job market is a very fluid field," says Will Cantrell of the International Employment Hotline. "It changes almost monthly. It requires some very thorough homework," he continues. "You have to study the market and study yourself to get a good idea of what you have to offer. That takes a real investment of time. To be realistic, I'd say it takes at least a year of research and planning."

It also takes some prudence. An overseas career is an enticing prospect for some people. So enticing that occasionally some unscrupulous individuals will take advantage of a jobseeker's innocence. Be skeptical, says Cantrell, of advertisements or agencies that promise high-paying jobs for a large advance fee. "The advance payment might be called a 'computer service fee' or a 'processing fee,' and is generally nonrefundable." Reputable placement services will frequently charge a percentage of your first year's salary if you receive a job. That's how they stay in business. "The real issue" for dishonest firms, says Cantrell, "is a large nonrefundable fee up front simply for the prospect of a job." Be wary.

Other ways to throw money away are less expensive. Frequently, ads appear offering directories or listings of thousands of overseas jobs. Sometimes these can be a valuable source of information. But only if they are current. Find out when the directory was published. If it's more than 2 years old, it's out of date.

fer the chance to gain significant overseas experience and develop the important job, language, and cultural skills necessary for a successful career overseas. Many Foreign Service Officers are former volunteers. And a spokesperson for AID says that nearly 50 percent of every IDIP class are former volunteers. For more information on the Peace Corps, call toll free (800) 242-8580.

Skills Being Sought

People with pertinent professional experience have the best chance for overseas jobs. Other countries view the U.S. as a reservoir of technology. Don Tierney of SHS International, an international job placement firm, says, "Engineers are always in demand. So are computer specialists. But," he adds, "employers want people with expertise in exact kinds of equipment."

Health care professionals are in demand and so are certain skilled tradesworkers, such as heavy equipment mechanics, electricians, and heating and air-conditioning mechanics.

The prospects aren't as good for other trades, such as carpentry. "These jobs are not as prevalent," says Cantrell. "Every country tries to protect these jobs for its own citizens."

In a final note, Cantrell says that "what makes the market are international contracts. Keep an eye on these and they'll give you a good clue as to what jobs will be available."

Teaching Overseas. Tracking down overseas opportunities can be a hit-or-miss proposition. For one group of professionals, teachers, information is easier to come by.

The Department of Defense's Office of Dependent Schools employs hundreds of educators to teach the children of military personnel stationed overseas. This overseas school system is one of the largest U.S. school systems, with 270 elementary, middle, junior, and high schools located in 20 foreign countries. For information on programs, placement, salaries, and benefits, write

Department of Defense
Dependent Schools
Recruitment and Assignments Section
2461 Eisenhower Avenue
Alexandria, Va. 22331.

The children of State Department personnel attend schools that receive some government assistance but are not government sponsored. The State Department's Office of Overseas Schools can provide information to teachers interested in opportunities with these schools. Write

Office of Overseas Schools (A/OS)
Room 234, SA-6
Department of State
Washington, D.C. 20520.

One agency directly involved in recruitment for these positions is

International Schools Services
126 Alexander Street
P.O. Box 5910
Princeton, N.J. 08540.

The Teacher's Guide to Teaching Positions in Foreign Countries is an excellent general guide to teaching positions abroad. To obtain it, write

Teacher's Guide to Teaching Positions
in Foreign Countries
Box 514
Ames, Iowa 50010.

Teaching Abroad lists organizations which sponsor exchange programs for U.S. citizens abroad. For information, write

Institute of International Education
Publications Division
809 United Nations Plaza
New York, N.Y. 10017.

Childcare Workers

by Ludmilla Murphy

Childcare workers look after young children whose parents cannot, because of work or other reasons. They do for the children many of the things that parents do. Those caring for infants and toddlers feed, bathe, diaper, play with, and comfort them. Those working with older preschoolers plan and carry out programs to stimulate the child's physical, emotional, and social growth, in addition to taking care of their basic needs.

The duties of childcare workers depend on the setting in which they work. Self-employed childcare workers taking care of a few children in their own homes, a setting often referred to as family daycare, have sole responsibility for those children. In addition to caring for children, self-employed childcare workers are responsible for a safe and clean environment, good nutrition, games, and other activities. Many also handle administrative duties, such as obtaining and renewing a license, hiring help, purchasing supplies, keeping records, mailing out bills, and recruiting children. Childcare workers in a large daycare center are in charge of groups of children under the supervision of a director who develops and administers the program.

Regardless of the children's age or the setting, childcare workers make sure that the childrens' basic physical, psychological, social, and educational needs are met. Typical duties include greeting children as they arrive, helping them remove outer garments, and teaching them how to dress and undress. They may organize and direct indoor and outdoor games and activities or take them on field trips. They select activities that provide self-expression and development through arts and crafts, music, and language; these may include painting and drawing, working with clay and wood, singing, reading, and story telling. Other activities provide physical exercise and teach children how to get along with others.

Childcare workers are also concerned with the children's health and

Ludmilla Murphy is a labor economist in the Division of Occupational Outlook, BLS. An article on this occupation will appear in the *Occupational Outlook Handbook*.

Photo by Alan Carey; copyright, all rights reserved

Copyright material has been deleted; not available for Microfiche Edition.

Childcare Workers

Photo by Paul Conklin

nutrition. They serve nutritious meals and snacks and use these as an opportunity to teach the children good eating habits and responsibility for cleaning up after themselves. They also see that the children have proper rest periods. They spot children who may be getting sick or showing signs of emotional or developmental problems. They discuss the child's development with the parents.

Working Conditions

Working conditions vary. Childcare facilities range from a single poorly furnished room to a large, fully equipped building. Some facilities accommodate a few children, others a hundred or more. Childcare centers are located in private homes, churches, and on the premises of universities, businesses, and other organizations that provide care for the children of employees. Others are in new or remodeled buildings used exclusively for childcare.

Self-employed providers of family daycare have great flexibility in their hours of work and daily routine. Because they work in their own home, they are able to handle some housekeeping responsibilities and look after their own children while caring for others.

Childcare centers are open year round. Many are open 12 hours a day. Full-time staff workers usually have 8-hour shifts; however, many work part time or have staggered hours.

Childcare workers spend much of their time standing, walking, bending, stooping, and lifting. They must be constantly alert, anticipate and prevent trouble, deal with disruptive children, and provide fair but firm discipline. This can be physically and emotionally taxing. The work is demanding and sometimes hectic; it requires a great deal of stamina. Rewards, on the other hand, come from seeing young children blossom and grow.

Employment

Childcare workers held 575,000 jobs in 1984. Many work part time. Almost two-thirds are self-employed; most care for children in their own homes. More than half of the salaried childcare workers are employed in independent childcare centers and residential childcare institutions. About 20 percent work in centers affiliated with churches or synagogues and in social or welfare agencies. Some are in State and local government agencies, hospitals, and employer-sponsored daycare centers.

Qualifications and Advancement

Entry level positions for childcare workers require little or no experience, for the most part. Although there are no specific educational requirements, employers prefer individuals with a high school diploma. Some employers provide on-the-job training by an experienced worker.

High school students who plan to work with small children should take courses in psychology, sociology, home economics, nutrition, and family living. Courses in art, music, drama, and physical education also provide good preparation. Volunteer or paid babysitting is helpful.

Formal training or certification is recommended for individuals who wish to advance. Many 2-year and 4-year colleges offer certificate and associate degree programs in childcare and guidance. Subjects include childhood development, child health care, child psychology, and play and educational activities.

The Child Development Associate (CDA) credential program offers an alternative certification. It stresses on-the-job performance and experience. The program is open to anyone 18 years of age or older. A team of childcare professionals conducts the assessment and decides whether the individual qualifies for the credential. The CDA assessment takes several months or longer.

Photo by Mark Antman; copyright, all rights reserved

Childcare workers should like working with small children and should be kind and patient. They should be in excellent health because the work requires much energy and stamina. Skills in music, art, drama, and storytelling are also important. Those who work for themselves must have good business sense and management ability. As childcare workers gain experience, they may advance to supervisory or administrative positions in larger centers. Often, however, these positions require additional training. Some set up their own childcare business.

Job Outlook

Job openings for childcare workers are expected to be plentiful through the mid-1990's. Most openings will arise because of the need to replace the high proportion of childcare workers who leave this very large occupation every year. There is considerable movement into and out of the occupation due to the ease of setting up childcare in one's home, limited education and training requirements, abundance of part-time jobs, and low pay.

Employment of childcare workers is expected to grow more slowly than the average for all occupations through the mid-1990's, primarily because of the anticipated slow growth of the number of preschool age children with working mothers. Employment is sensitive to ups and downs in the economy. During recessions, the number of parents who cannot find jobs increases, and parents who are not employed are less likely to need childcare.

Earnings

In 1984, median annual earnings of full-time childcare workers were $9,200. The middle 50 percent earned between $6,800 and $12,300; the top percent earned at least $15,600.

Wages of childcare workers vary depending on the part of the country and the type of center in which they work. Wages are highest in the West and lowest in the Southeast. Wages tend to be higher in larger centers and lower in church-affiliated centers. Many entry level childcare workers receive only the minimum wage of $3.35 an hour. Earnings of self-employed childcare workers vary even more than those of wage and salary workers, depending on the number and ages of the children and the geographic area.

Related Occupations

Childcare requires a wide variety of aptitudes and skills, including patience, creativity, an ability to motivate, teach, and influence others, and, in some cases, leadership and organizational and administrative abilities. Other occupations that require these aptitudes include teacher aide, children's tutor, foster parent, recreational therapist, social worker, and early childhood program director.

Sources of Additional Information

For general information about childcare workers, contact

National Association for Childcare Management
1255 23rd Street, NW
Washington, D.C. 20037

Childcare Employee Project
P.O. Box 5603
Berkeley, California 94705

For information on childcare center accreditation standards and program development and resources, contact

National Association for the Education of Young Children
1834 Connecticut Avenue, NW
Washington, D.C. 20009

For eligibility requirements and a description of the Child Development Associate (CDA) credential, write

CDA National Credentialing Program
Room 802
Washington, D.C. 20005

Career Information in the Classroom

Recently, Mike Stanton, the *Quarterly's* staff writer, and I met with several groups of counselors and career aides to learn how the *Quarterly* and the *Occupational Outlook Handbook* could be improved. Several people said they would like more information on using the *Handbook* in the classroom, a subject about which we knew very little. As luck would have it, however, a very useful guide to this subject was about to be published. This new publication, called *Career Information in the Classroom: Workshop Guide for Infusing the Occupational Outlook Handbook*, produced by the National Center for Research in Vocational Education is the result of a 2-year project funded by the National Occupational Information Coordinating Committee (NOICC) and the former U.S. Office of Career Education. The workshops, designed for teachers in grades K through 12, cover both occupational exploration in general and the *Handbook* in particular. Although the *Guide* was listed under Counseling Aids in the Winter 1985 *Quarterly*, we thought you might like a fuller description because of the interest expressed at the meetings.

Neale Baxter, the managing editor of the OOQ, wrote this summary.

The *Guide* provides detailed information on conducting workshops that will increase a teacher's ability to make career exploration part of the curriculum. It contains suggested lectures, workshop activities, sample lesson plans, lists of resources, masters for transparencies, and samples of handouts and worksheets that are available separately.

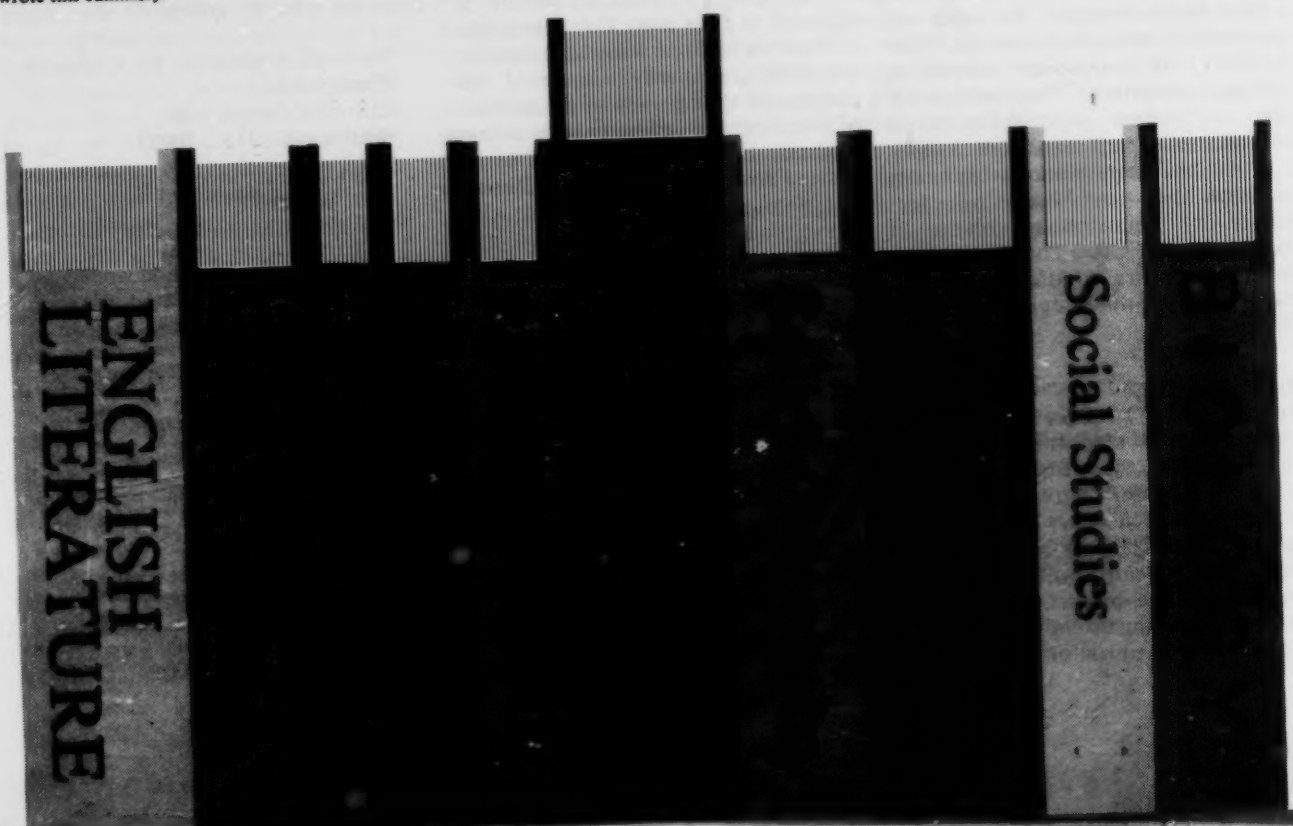
The *Guide*—a 512-page looseleaf binder—has six chapters or modules:

- Basic Principles of Career Development
- How To Develop Infused Activities
- The OOH and Occupational Information
- Understanding the Labor Market
- Understanding the Economy
- Exploring Careers

All the modules have a similar format. The first page states the purpose of the module, the key concepts it addresses, and the teacher competencies it reinforces. This is followed by one or more very detailed plans for a workshop, or learning experience, in the *Guide's* terminology. For each workshop, the *Guide* specifies the key concepts, competencies, and objectives covered, and also gives pertinent instructor's information, such as instructional time, resources, and methods. A detailed instructor's outline, masters for suggested transparencies, samples of worksheets and handouts, abstracts of related teaching activities, and annotated bibliographies provide almost all the information needed by the person leading the training session. The full series of 15 workshops would take approximately 17 hours to complete, but the workshop leader has considerable flexibility in deciding what topics to cover and how long to spend on each.

The range of material available in the *Guide* can best be indicated by pointing out highlights from each of its chapters.

"Module I: Basic Principles of Career Development" concerns the relationship of an individual's career



development to basic career development principles and the relationship of career development concepts to a curriculum. Among the activities are a quiz on work and workers, practice vocational interviews, and an "X Y Z Choice" activity that enables the group to learn the principles of decisionmaking.

"X Y Z Choice" is a copyrighted activity drawn from *Decisions and Outcomes: A Leader's Guide*, by H.B. Gelatt and others (New York: College Entrance Examination Board, 1973). Participants make a series of six decisions in order to show that they follow some strategy in making them, whether consciously or not. The exercise also demonstrates that knowledge of each of the aspects of decisionmaking—alternatives, outcomes, probability, and desirability—is essential.

Also included is a sample of a 20-page handout, "Career Development Theories: A Beginner's Overview." The handout discusses about a dozen theories of career development, such as Holland's typological approach and more recent theories concerning development over a lifetime. Bibliographies follow each brief discussion of a theory.

"Module II: How To Develop Infused Activities" mixes quizzes, discussions, and small-group activities. The third workshop in this module is called "How to Infuse." Participants are given examples of noninfused and infused lessons and work in small, homogeneous groups to develop their own lesson plans. Support materials include four sample lessons plans for various grade levels and subjects.

"Module III: The OOH and Occupational Information" has as its key concepts the ideas that the *Handbook* contains information that can be incorporated into the curriculum and that students should receive occupational information. Two workshop activities are described: How the OOH is Organized and Importance of Occupational Information. The purpose of the first workshop experience is to increase the participants' awareness of the content and organization of the *Handbook*. The instructor presents the major sections of the *Handbook*; then, participants locate information in it. A handout on questions for the book is included along with a suggested transparency on the major components of the OOH and three pages of lecture notes and sample questions. For the second learning experience, participants break into small groups and suggest examples of how the information contained in the *Handbook* can be used in the classroom.

"Module IV: Understanding the Labor Market" concerns such subjects as the relationship of supply and demand to the labor market, the classification of industries and occupations, the infusion of occupational classification activities into the curriculum, and the relative importance of job openings due to employment growth and replacement needs. One of the group activities suggested is to write a lesson plan, following, if the participants wish, some of the lesson plans provided. Handouts include information for short lectures on the topics covered, Role Worker Cards for use in a role-playing activity, and such suggested school activities as having first grade students sort pictures from magazines according to whether they depict goods or services.

"Module V: Understanding the Economy" points out that a local economy is conditioned by the nature of its population, climate, location, resources, industries, and public policies. Similarly, the Nation's economic condition constantly changes because of decisions made by businesses, consumers, and governments. Factors that affect national and local economies include changing technologies, business conditions, population patterns, consumer preferences, and cost of resources. One workshop deals specifically with the implications of changing technology on workers and the economy.

The first workshop exercise has to do with comparisons of different cities. Participants are given some information about each and then discuss the probability of one city having more or less of some good or service. One exercise requires participants to select three national economic events, such as oil embargoes, and describe their effect on hometown businesses. A sample lesson plan suggests that students in a 12th grade social studies class could debate such issues as deregulation of the trucking industry, public-supported health care for all citizens, and mandatory wage and price controls.

"Module VI: Exploring Careers" contains two workshops, one on personal attributes and one on occupational characteristics. One sample handout lists nine interests, such as doing creative work, and nine abilities, such as perceiving details. As an introduction to the process of exploring personal attributes, students are asked to rate their interest or ability on a scale of three for each.

In another exercise, sets of cards with various interests, abilities, values, experience, and training are distributed to participants who then try to determine appropriate occupations. An annotated bibliography describes some of the published resources that can assist students in exploring careers.

Workshops on the use of the *Handbook* and other career information in the classroom should result in numerous fruitful ideas for teachers and counselors. We would be happy to report on the suggested activities in future issues of the *Quarterly*. Send your suggestions to the *Occupational Outlook Quarterly*, PH 4000, Bureau of Labor Statistics, Washington, D.C. 20212.

Career Information in the Classroom: Workshop Guide for Infusing the Occupational Outlook Handbook is published by the Meridian Education Corporation, 205 East Locust Street, Bloomington, Illinois 61701. Prices depend on the number of copies ordered:

1 to 9 copies	$49.00 each
10 to 49 copies	44.00 each
50 to 249 copies	39.50 each
250 to 999 copies	34.50 each
1000 or more copies	29.50 each

The 150-page set of handouts (samples of which are included in the *Guide)* are also priced according to the number ordered:

1 to 9 copies	$12.95 each
10 to 49 copies	11.65 each
50 to 249 copies	10.36 each
250 to 999 copies	9.07 each
1000 or more copies	7.77 each

You're a **What?**

COMMERCIAL DIVER

When Mike Parks goes to work, he steps out of our world and slips into another—the strange, wonderful, and frequently dangerous world beneath the sea. He is a commercial diver.

Mike's introduction to diving occurred in the cold waters of Lake Huron when he was 12 years old, and he quickly became an accomplished diver. His underwater skills helped pay for his education at the University of Michigan. He taught scuba diving in the university's physical education program. During summer vacations he worked for an underwater salvage company.

He graduated from college with a double major in history and psychology and aspired to become a teacher. But a long, fruitless job search prompted him to turn to the skills that had paid his bills in the past. He took a job with a salvage company and then worked as a freelance diver for 5 years. His assignments carried him around the globe—from Pakistan, where he worked on the world's largest earthen dam, to offshore oil projects along Chile's Pacific coast. In 1977, he started his own company. Today, Parks Diving Corporation has offices in Maryland, Michigan, and Puerto Rico.

Working underwater is nothing new. For thousands of years, divers have searched the sea floor for natural treasures such as pearls. Even today, some pearl divers use the same methods that were practiced a millenium ago—take a gulp of air and dive for the bottom. But that's not the business of diving today.

"Ninety-five percent of commercial diving is 'surface supply diving,' " says Parks, "where a compressor

---

Michael Stanton, the OOQ's staff writer, interviewed Mike Parks.

pumps air to the diver." This is opposed to scuba diving—which is an acronym for "self-contained underwater breathing apparatus."

Scuba diving may afford more mobility to the recreational diver, but surface supply offers distinct advantages for the person who makes a living underwater. Surface supply provides unlimited air to a diver. A scuba diver can stay under only as long as air remains in the tanks. Surface supply offers constant contact with the surface via the dive hose and also enables radio communications between divers. Scuba divers have no contact with the surface, and most rely upon hand signals underwater. Surface supply divers can also work at much greater depths because of mixed gas and hot water suits and helmets. The limit on recreational scuba diving is 130 feet.

"Diving schools around the country churn out a lot of divers," says Parks. But many of these divers fail to realize that "diving is just a way to get to the job," he adds emphatically. "Many people come to me looking for work and say 'I'm a diver'," says Parks. "That's great, but if I want bubbles, I can throw an air hose in the water and get the same effect. It's what you do when you get down there that people pay for."

Commercial divers work in three principal areas—offshore oil, underwater construction, and salvage. To get a job, you have to have some basic skills, such as welding and pipefitting. "You have to learn a trade on the surface before working underwater. I'd rather teach a welder how to dive than a diver how to weld," Parks says.

Most of the jobs Parks undertakes in the Baltimore area involve basic construction, repair, and salvage. He employs 12 full-time divers and has a call list of freelancers whom he has screened and interviewed. He also keeps a number of other professionals, such as marine engineers and architects, on retainer to help on special jobs.

About 90 percent of the construction and repair work is preengineered. But, when emergencies arise, he might have to devise a repair strategy that requires some quick thinking. "You also need to be a good communicator to be able to explain the problem and the solution to the customer," he says.

Increasingly, says Parks, his firm is doing more underwater hull cleaning. Barnacles and marine vegetation on a ship's hull create drag and increase fuel costs greatly. Using a machine that resembles a giant vacuum cleaner, divers can whisk a hull clean. It takes about 2 days to clean an 800-foot ship and can cost close to $15,000. But the shipowner can recover this cost in fuel savings on one long voyage.

Commercial divers also do deepwater salvage, which, says Parks, "is some of the most dangerous work a person can do. Deaths are not uncommon."

Parks worked his first salvage dive while he was still a student.

"One summer I worked on the salvage of a shipwreck in Lake Huron that had a cargo of sheet steel. It had sunk 5 years before in 150 feet of water. But it was fresh water, deep, dark, and cold, and the steel was still shiny.

"We had to enter the holds, clamp each sheet, and lift them one at a time with a crane from the salvage ship. A cable snapped; the steel fell and caught the air hose of one diver. By the time he was freed and brought to the surface, it was too late."

Parks has had close calls himself. The closest occurred at the bottom of the Atlantic during the salvage of the treasure ship Merida.

During the Mexican revolution, in the early part of this century, many of the rich sent their valuables north for safekeeping. On storm-tossed seas 60 miles east of Chincoteague Island, Virginia, the Merida collided with the U.S.S. Admiral Farragut and sank in 220 feet of water. Many salvage operations were undertaken to retrieve her treasure, but nearly 4,000 pounds of silver ingots were never recovered. Parks joined in an expedition to find them.

"It was an incredible dive," Parks remembers. "We had whales, porpoises, and hammerhead sharks all around us. This dive almost killed me.

"I was on the bottom with two of the largest scuba tanks you can get. I also had a backup system. I began to suffer a little narcosis, became disoriented, and couldn't find the anchor line. I couldn't come straight up because I'd get the bends or a blocked blood vessel for sure. My air was running low. By the time I found the line, my tanks were empty. I barely reached the decompression chamber on my backup system."

They didn't find the silver either. After a month's diving and expenditures of more than a quarter of a million dollars, the search was abandoned. "All we found were a couple of lobsters."

In this dive, Parks encountered several of the dangers that a diver can face that are caused by the physiological effects of nitrogen. At sea level, nitrogen, which makes up 80 percent of the air we breathe, is an innocuous gas. But, with increasing pressure underwater, it can create an intoxicating effect called nitrogen narcosis that can endanger even the most

experienced divers. The bends, probably the most common diving disorder, can result if a diver ascends, or decompresses too quickly. Nitrogen, unlike oxygen, does not combine chemically with blood, but goes into solution. With a rapid decrease in pressure, it reacts like a shaken soda bottle and forms bubbles. Trapped in the body, these bubbles can cause pain, paralysis, or even death.

Situations such as this demand a cool head, but that's easier said than done. "You're always on the edge," says Parks. "Panic is the number one cause of death underwater."

Divers must be attuned to their bodies. Even a slight decline in motor skills or stiffness in joints can be a sign of nitrogen overload. Some divers are beginning to use decompression meters, which strap to the wrist and give digital readings on barometric pressure, temperature, ceiling—which is the level to which a diver can ascend without decompressing—and even altitude. This comes in handy, says Parks, if you're diving at higher altitudes, such as in a reservoir up in the mountains. The meter even measures physiological functions and computes how much nitrogen is entering the bloodstream.

Aside from the basic construction and diving skills, divers need a few special ones. "You need mechanical aptitude," says Parks, "and you should know how to maintain different kinds of engines and be able to diagnose a problem and correct it. You should know how to handle a camera, too." Divers must frequently document their work, and pictures provide the best evidence.

Becoming a diver requires a substantial investment because a diver needs his own equipment. A good diving suit costs from $500 to $1,500 and a mask or helmet will run from $1,000 to $3,000, according to Parks. But the expense is worth it. Good equipment can mean the difference between life and death.

A helmet and pressure suit are necessary to equalize water pressure. "For every foot you dive, you gain ½ psi (pounds per square inch). If you dive 200 feet, pressure is about 100 psi. Multiply that by the number of square inches of body surface and you're talking about tons of pressure." Most of today's helmets have a check valve to prevent the loss of pressure if air supply is cut off.

Parks says, "I've heard stories of divers being crushed to death because they lost pressure in their suit. The only thing that could withstand the pressure was the helmet. That's where they'd be found. Water pressure acted like a hydraulic ram and compressed them right into their helmets."

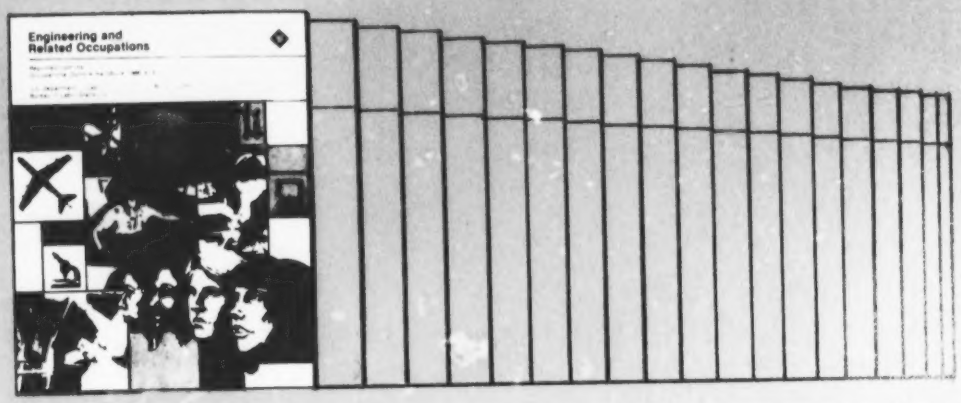
Big risks means big pay. Of the three kinds of commercial diving, offshore oil pays the most. It's not unusual for a diver to make $100,000 per year. Some oil companies have their own teams of divers, but usually this function is contracted out to diving companies. The professional life span of an offshore diver is short, however. Insurance companies will not cover offshore divers over 30 years of age. A construction or salvage diver can work as long as he is physically able. "Deep-water salvage can pay as much as offshore oil work," says Parks, "depending on the job and how often you work. Construction divers can make upwards of $60,000 a year."

To earn sums like this, a diver must have skills that can be acquired only through training and practice. Parks says that several avenues of training are available. Commercial diving schools, mentioned earlier in this article, are one option. But, before you enroll, examine the program carefully to assure that instruction in basic skills, such as underwater welding, is offered. Another possibility for training is with the U.S. Navy. "The Navy Seabees turn out some good divers," says Parks. A third possibility is training with an established company. On occasion, Parks says, he has hired people with no diving experience, but, in every such case, the person was already a skilled craftworker.

"There always is and always will be a need for top notch commercial divers," says Parks. "But diving requires the right mixture of skills and a few intangibles," he says. "You have to be a risktaker, a daredevil." Mike Parks is that kind of man. Even his hobbies attest to that. On his days off he races motorcycles.

Is the Occupational Outlook Handbook sometimes too much of a good thing?

Try reprints!



All sections of the 1986–87 ***Occupational Outlook Handbook*** are available in reprint form. Reprints are especially useful for jobseekers who want to know about a single field and for counselors who need to stretch the contents of a single Handbook among many students.

The titles of all 21 reprints are listed here.

Price of reprints: $1.25 each. A complete set costs only $22. Use the order form provided. (Note: A discount of 25 percent will be allowed on purchase of 100 or more copies of a single reprint when mailed to a single address.)

Make all checks payable to the Superintendent of Documents.

Credit card orders must be sent directly to the Superintendent of Documents.

Mail other orders to:

Bureau of Labor Statistics
Publications Sales Center
P.O. Box 2145
Chicago, IL 60690

or

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

Order Form

Please send the following reprints from the 1986–87 *Occupational Outlook Handbook*:

Bulletin No.	Title	Quantity	Price
☐ 2250–1	Tomorrow's Jobs: Overview		
☐ 2250–2	Business, Managerial, and Legal Occupations		
☐ 2250–3	Engineering and Related Occupations		
☐ 2250–4	Computer and Mathematics-Related Occupations		
☐ 2250–5	Physical and Life Scientists		
☐ 2250–6	Education, Social Service, and Related Occupations		
☐ 2250–7	Medical, Dental Practitioners, and Assistants		
☐ 2250–8	Dietetics, Nursing, Pharmacy, and Therapy Occupations		
☐ 2250–9	Health Technologists and Technicians		
☐ 2250–10	Communications, Design, Performing Arts, and Related Occupations		
☐ 2250–11	Technologists and Technicians, Except Health		
☐ 2250–12	Sales Occupations		
☐ 2250–13	Clerical and Other Administrative Support Occupations		
☐ 2250–14	Protective Service Occupations and Inspectors		
☐ 2250–15	Service Occupations: Food, Cleaning, Health, and Personal		
☐ 2250–16	Mechanics, Equipment Installers, and Repairers		
☐ 2250–17	Small Business Occupations		
☐ 2250–18	Construction and Extractive Occupations		
☐ 2250–19	Metalworking Occupations		
☐ 2250–20	Production Occupations		
☐ 2250–21	Transportation and Material Moving Occupations		
☐	Set of 21 reprints		
		Total price	

☐ Enclosed is a check or money order payable to the Supeintendent of Documents

☐ Charge to GPO Account No.

☐ Charge to ☐ VISA ☐ MasterCard ☐ CHOICE

Account No. Expiration date

Name

Organization
(if applicable)

Address

City, State,
and Zip Code

U.S. Department of Labor
Bureau of Labor Statistics
Washington, D.C. 20212

Official Business
Penalty for Private Use, $300

Second Class Mail
Postage and Fees Paid
U.S. Department of Labor
ISSN 0199-4786

Work Around the World
Page 20

30/3

Educ REFERENCE C
NEWARK PUBLIC LIBRARY

NEWARK PUBLIC
SEP 25 1986
U. S. GOVT. PUBS.
DEPOSITORY 326

L 2.70/4:

U.S. Department of Labor
William E. Brock, Secretary

Bureau of Labor Statistics
Janet L. Norwood, Commissioner

The ***Occupational Outlook Quarterly*** is published four times per year by the Occupational Outlook Service, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212. Second-class postage paid at Washington, D.C., and at additional mailing offices. **Postmaster:** Send address changes to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

For Sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Subscription price $11 domestic, $13.75 foreign; single copy price $3 domestic, $3.75 foreign.

Editor's Note: Articles contributed by authors outside the U.S. Department of Labor do not necessarily represent the views of the Department. Questions on occupational and career information should be sent to Inquiries and Correspondence, Bureau of Labor Statistics, GAO Building, Washington, D.C. 20212. Communications on editorial matters should be addressed to the Editor, Occupational Outlook Quarterly, Bureau of Labor Statistics, Washington, D.C. 20212. Phone: (202) 272-5298.

The Secretary of Labor has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department.

ISSN 01994786

Bureau of Labor Statistics Regional Offices

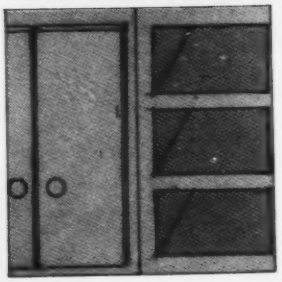
Boston	Suite 1603 Federal Office Bldg. Government Center Boston, Mass. 02203	Phone: (617) 565-2331
New York	Suite 3400 1515 Broadway New York, N.Y. 10036	Phone: (212) 944-3121
Philadelphia	P.O. Box 13309 Philadelphia, Pa. 19101	Phone: (215) 596-1154
Atlanta	1371 Peachtree St. NE. Atlanta, Ga. 30367	Phone: (404) 347-4418
Chicago	9th Floor Federal Office Bldg. 230 South Dearborn St. Chicago, Ill. 60604	Phone: (312) 353-1880
Dallas	Federal Bldg. 525 Griffin St., Room 221 Dallas, Tex. 75202	Phone: (214) 767-6971
Kansas City	911 Walnut St. Kansas City, Mo. 64106	Phone: (816) 374-2481
San Francisco	450 Golden Gate Ave. Box 36017 San Francisco, Calif. 94102	Phone: (415) 556-4678

P.2

P.13

P.20

P.26



P.31

OCCUPATIONAL OUTLOOK QUARTERLY
Fall 1986
Volume 30, Number 3

Melvin Fountain, *editor*
Neale Baxter, *managing editor*
Michael Stanton, *staff writer*
Richard Mathews, *art director*

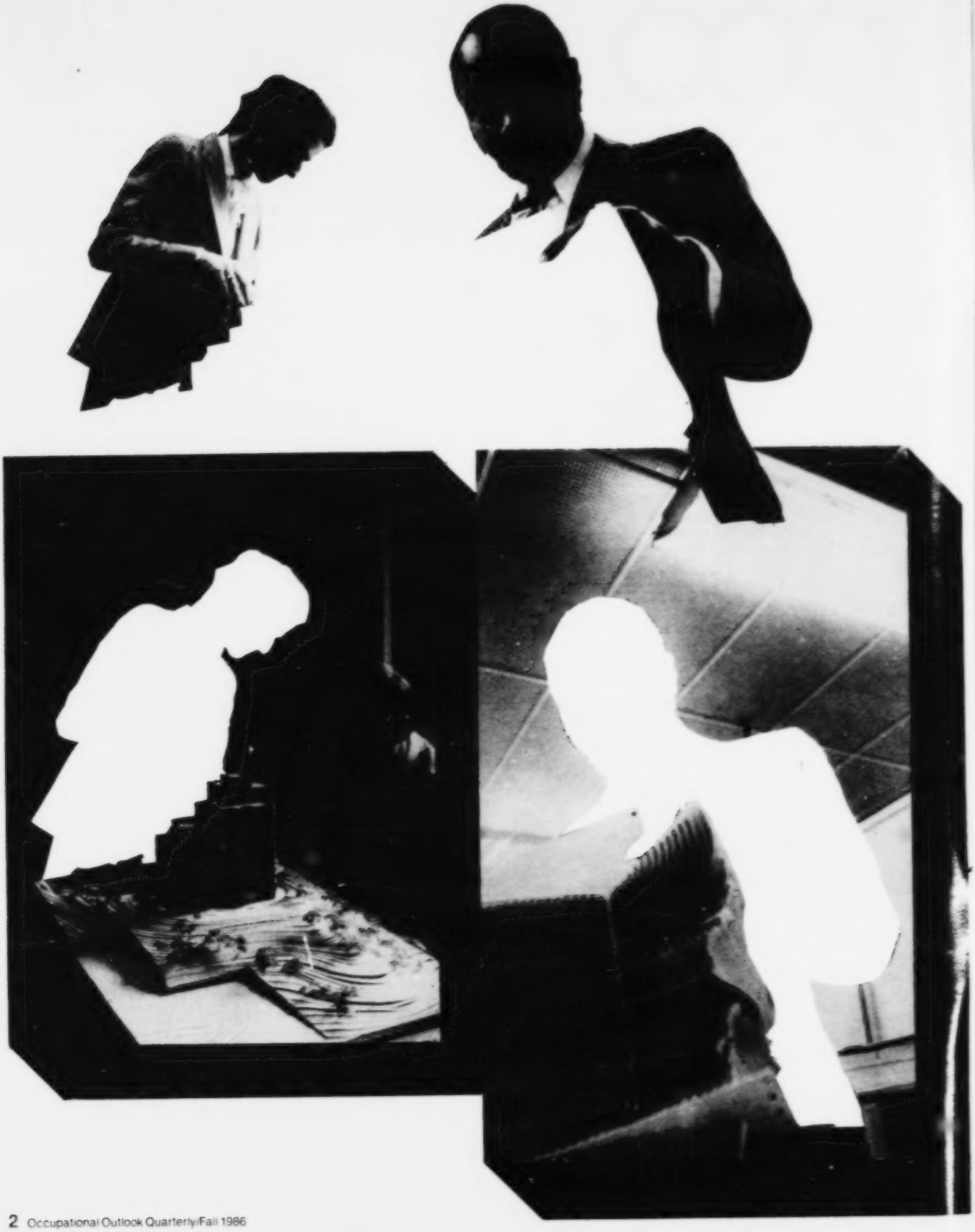
Matching Yourself With the World of Work, 1986 Edition — Melvin Fountain — 2
Jobs differ widely in the ability, educational level, and other attributes they require of workers. This table lists 17 characteristics of jobs—such as leadership, manual dexterity, and salary level— and shows the characteristic's relation to 200 occupations. Students can use this table to compare their interests with the characteristics of an occupation.

Opportunities in Franchising — William Austin — 13
A franchise may considerably improve chances of success in business, but innovative owners who like to conduct business in their own way may not be happy with the arrangement.

Temporary Jobs — Max L. Carey and Kim L. Hazelbaker — 20
It's a field growing by leaps and bounds. Office jobs predominate, but unskilled and technical temporaries are also in demand.

Employment Interviewers — Stephen Tise — 26
Private employment agencies and temporary help firms employ a majority of employment interviewers. These firms typically require little specialized college training to qualify for the work, making entry into the occupation relatively easy.

You're a What? Cabinetmaker — Michael Stanton — 31
Think woodworking is the most important skill of the cabinetmaker? Think again. Ability to conceptualize how a piece of furniture should fit together may be equally critical.



Matching Yourself With the World of Work *1986 Edition*

by Melvin Fountain

So you're trying to decide on a career? Good luck. With some 35,000 job titles to choose from, it won't be easy. You will probably never seriously consider more than a dozen or so of these careers. Nevertheless, making a wise choice among even this small number will depend on many imponderables, not the least of which is just plain luck.

Effective counseling and up-to-date information can narrow the uncertainties in this process. But whether career guidance be informal talks with parents or friends or a formal in-school guidance course, the objective is the same—to match personal talents and goals with those demanded by a given field of work.

Knowing, for example, whether there are part-time opportunities in an occupation or knowing that a job does—or does not—require working with people or physical stamina can be important. And the degree of employment growth or competition in a field may affect whether you get a job in it or how fast you advance.

The following guide was designed to help you compare these types of job characteristics with your interests and skills. Listed and defined are 17 occupational characteristics and requirements that are matched in the chart that follows with 200 occupations chosen from the 1986-87 *Occupational Outlook Handbook*.

The table can be used in at least three ways. First, if you already have some idea of which occupation you wish to enter, you can use the table to find out the general characteristics of that occupation. Second, if you've decided on a general field of work—such as health or sales—but not on a particular occupation, the table can help you learn about the different jobs in that field. Third, if you haven't thought much about occupations, but you do know what skills you have, the table can introduce you to several occupations you might be good at.

One note of caution: The chart can be helpful in organizing occupational information, but it is intended only as a general exploratory tool. Before you eliminate an occupation from consideration because of a single characteristic, you should realize that the job characteristics presented in the table refer only to a typical job in the occupation.

All jobs in an occupation are not alike. Most accountants, for example, work alone, but accountants who are auditors or investigators may work with others. Therefore, if you have an interest in an occupation, you should not disregard that career simply because one or two of its characteristics do not appeal to you. You should check further into the occupation—either through reading or by talking to your counselor—to find out how particular jobs in the occupation or occupational cluster might match up with your personality, interests, and abilities.

Following is a list—together with definitions—of the characteristics shown in the chart. Specific occupations are sometimes listed to give an idea of the kinds of skills included.

Job Requirements

(1) Leadership/persuasion—stimulate others to think or act in a certain way. Automobile sales workers and blue-collar supervisors are examples of occupations in which one must motivate others. Skills include organizing people and groups, supervising, directing, taking the initiative, preaching, selling, promoting, counseling, speechmaking, negotiating, and mediating.

(2) Helping/instructing others—help others to learn how to do or understand something. Skills include treating, teaching, listening, and counseling.

(3) Problem-solving/creativity—develop new ideas, programs, designs, or products. Commercial artists who prepare the artwork in magazines and engineers who design machinery are examples of occupations that require creativity. Skills include designing, inventing, drawing, writing, and developing ideas or programs.

(4) Initiative—determine what needs to be done and complete the job without close supervision. A department store buyer, for example, must use initiative in anticipating customers' preferences, buying merchandise at the right price, and seeing that goods are in stock when needed.

(5) Work as part of a team—interact with fellow employees to get the work

Melvin Fountain is editor of the OOQ.

Matching

done. A school administrator, for example, works cooperatively with school principals, community members, and government officials.

(6) Frequent public contact—meet or deal with the public on a regular basis. A librarian, for example, must meet and deal easily with the public.

(7) Manual dexterity—make, build, and fix things with the hands. Skills include operating tools, testing, drafting, instructing sports activities, and moving rhythmically.

(8) Physical stamina—endure stress and strain, heavy lifting, standing, or being uncomfortably confined for long periods.

Work Environment

(9) Hazardous—withstand conditions that are dangerous, such as working with infectious materials or working in surroundings where accidents are common. Most such jobs require adherence to safety precautions. Medical laboratory workers, for example, must use precautions when handling infectious material.

(10) Outdoors—spend a major portion of time outdoors, usually without regard to weather conditions.

(11) Confined—stay in a specific place for most of the workday.

Occupational Characteristics

(12) Geographically concentrated—50 percent or more jobs located in five States or fewer.

(13) Part-time—many workers employed for less than 35 hours a week.

(14) Earnings—three categories of earnings, based on 1985 averages, are shown:

L = lowest (10 percent or less)
M = middle (11 to 19 percent)
H = highest (20 percent or more)

Keep in mind that earnings within an occupation vary widely and that some workers earn more and some earn less than the average.

(15) Employment growth—three categories of projected growth from 1984 to 1995 are shown:

L = lowest
M = middle
H = highest

Job opportunities are usually favorable if employment is expected to increase at least as rapidly as for the economy as a whole (15 percent). But don't pick a job based solely on growth. Because of the need to replace workers who retire or leave the occupation for other reasons, slow-growing occupations may actually have more job opportunities than their growth rates indicate.

(16) Number of new jobs, 1984-85—the projected number of new jobs expected to become available. In most occupations, the number of job openings created by the need to replace workers who change occupations or leave the labor force will be much higher than the number of new jobs.

(17) Entry requirements—three categories of education and training requirements are shown:

L = high school or less education is sufficient, and the basics of the job can usually be learned in a few months of on-the-job training;
M = post-high school training, such as apprenticeship or junior college, or many months or years of experience are required to be fully qualified;
H = 4 or more years of college usually required.

The World of Work

	Job requirements										Work environment			Occupational characteristics			
	1. Leadership/persuasion	2. Helping/instructing others	3. Problem-solving/creativity	4. Initiative	5. Work as part of a team	6. Frequent public contact	7. Manual dexterity	8. Physical stamina	9. Hazardous	10. Outdoors	11. Confined	12. Geographically concentrated	13. Part-time	14. Earnings	15. Employment growth	16. Number of new jobs, 1984-95 (in thousands)	17. Entry requirements
Executive, Administrative, and Managerial Occupations																	
Managers and Administrators																	
Bank officers and managers	•	•	•	•	•	•				•			H	H	119		H
Health services managers	•	•	•	•	•	•							H	H	147		H
Hotel managers and assistants	•	•	•	•	•	•							[1]	H	21		M
School principals and assistant principals	•	•	•	•	•	•							H	L	12		H
Management Support Occupations																	
Accountants and auditors		•	•		•	•				•			H	H	307		H
Construction and building inspectors		•	•	•	•		•		•				M	L	4		M
Inspectors and compliance officers, except construction		•	•	•	•		•		•				H	L	10		M
Personnel, training, and labor relations specialists	•	•	•	•	•	•							H	M	34		H
Purchasing agents	•		•		•	•							H	M	36		H
Underwriters			•										H	H	17		H
Wholesale and retail buyers	•	•	•	•	•								M	M	28		H
Engineers, Surveyors, and Architects																	
Architects			•	•	•	•	•						H	H	25		H
Surveyors	•				•		•	•		•			M	M	6		M
Engineers																	
Aerospace engineers			•	•	•							•	H	H	14		H
Chemical engineers			•	•	•								H	H	13		H
Civil engineers			•	•	•								H	H	46		H
Electrical and electronics engineers			•	•	•								H	H	206		H
Industrial engineers			•	•	•								H	H	37		H
Mechanical engineers			•	•	•								H	H	81		H
Metallurgical, ceramics, and materials engineers			•	•	•								H	H	4		H
Mining engineers			•	•	•								H	L	[2]		H
Nuclear engineers			•	•	•								H	L	1		H
Petroleum engineers			•	•	•							•	H	M	4		H

[1] Estimates not available.
[2] Less than 500.

Matching

World of Work continued

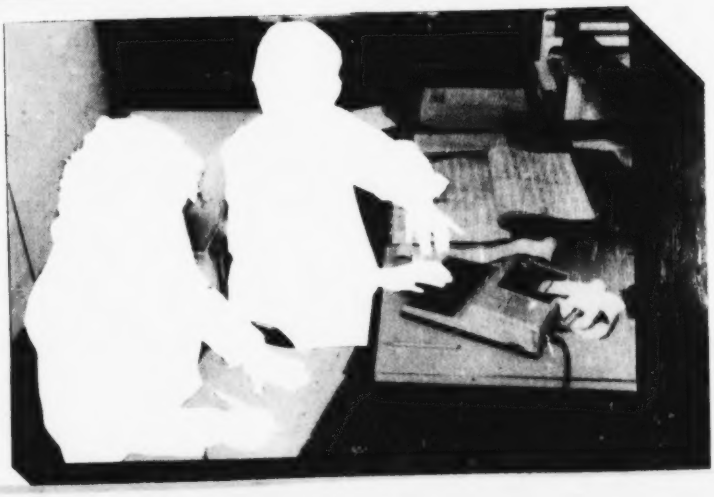
	Job requirements										Work environment			Occupational characteristics			
	1. Leadership/persuasion	2. Helping/instructing others	3. Problem-solving/creativity	4. Initiative	5. Work as part of a team	6. Frequent public contact	7. Manual dexterity	8. Physical stamina	9. Hazardous	10. Outdoors	11. Confined	12. Geographically concentrated	13. Part-time	14. Earnings	15. Employment growth	16. Number of new jobs, 1984–95 (in thousands)	17. Entry requirements
Natural Scientists and Mathematicians																	
Computer and Mathematical Occupations																	
Actuaries			•	•						•	•			H	H	4	H
Computer systems analysts	•	•	•	•	•					•				H	H	212	H
Mathematicians			•	•										H	M	4	H
Statisticians			•	•										H	M	4	H
Physical Scientists			•	•										H	M		H
Chemists			•	•										H	L	9	H
Geologists and geophysicists			•	•	•					•		•		H	M	7	H
Meteorologists			•	•	•									H	M	1	H
Physicists and astronomers			•	•										H	L	2	H
Life Scientists																	
Agricultural scientists			•	•										[1]	M	3	H
Biological scientists			•	•										H	M	10	H
Foresters and conservation scientists		•	•	•	•			•	•	•				H	L	2	H
Social Scientists, Social Workers, Religious Workers, and Lawyers																	
Lawyers	•	•	•	•	•	•								H	H	174	H
Social Scientists and Urban Planners																	
Economists			•	•										H	M	7	H
Psychologists		•	•	•		•								H	H	21	H
Sociologists			•	•		•								H	L	[2]	H
Urban and regional planners	•		•	•	•	•								H	L	2	H
Social and Recreation Workers																	
Social workers	•	•	•	•	•	•								M	H	75	H
Recreation workers	•	•	•	•	•	•	•	•		•			•	L	H	26	M
Religious Workers																	
Protestant ministers	•	•	•	•	•	•								L	[1]	[1]	H
Rabbis	•	•	•	•	•	•								H	[1]	[1]	H
Roman Catholic priests	•	•	•	•	•	•								L	[1]	[1]	H

[1] Estimates not available.
[2] Less than 500.

World of Work continued

	Job requirements									Work environment				Occupational characteristics			
	1. Leadership/persuasion	2. Helping/instructing others	3. Problem-solving/creativity	4. Initiative	5. Work as part of a team	6. Frequent public contact	7. Manual dexterity	8. Physical stamina	9. Hazardous	10. Outdoors	11. Confined	12. Geographically concentrated	13. Part-time	14. Earnings	15. Employment growth	16. Number of new jobs, 1984–95 (in thousands)	17. Entry requirements
Teachers, Counselors, Librarians, and Archivists																	
Kindergarten and elementary school teachers	●	●	●	●	●	●	●	●						M	H	281	H
Secondary school teachers	●	●	●	●	●	●		●						M	L	48	H
Adult and vocational education teachers	●	●	●	●	●	●	●	●					●	M	M	48	H
College and university faculty	●	●	●	●	●	●		●					●	H	L	– 77	H
Counselors	●	●	●	●	●	●								M	M	29	H
Librarians	●	●	●	●	●	●		●					●	M	L	16	H
Archivists and curators			●	●	●									M	L	1	H
Health Diagnosing and Treating Practitioners																	
Chiropractors	●	●	●	●	●	●	●							H	H	9	H
Dentists	●	●	●	●	●	●	●							H	H	39	H
Optometrists	●	●	●	●	●	●	●							H	H	8	H
Physicians	●	●	●	●	●	●	●						●	H	H	109	H
Podiatrists	●	●	●	●	●	●	●							H	H	4	H
Veterinarians	●	●	●	●	●	●	●	●	●					H	H	9	H
Registered Nurses, Pharmacists, Dietitians, Therapists, and Physician Assistants																	
Dietitians and nutritionists	●	●	●	●	●	●								M	H	12	H
Occupational therapists	●	●	●	●	●	●	●	●						[1]	H	8	H
Pharmacists	●	●	●	●	●	●					●			H	L	15	H
Physical therapists	●	●	●	●	●	●	●	●						M	H	25	H
Physician assistants	●	●	●	●	●	●	●							M	H	10	M
Recreational therapists	●	●	●	●	●	●	●	●		●				M	H	4	M
Registered nurses	●	●	●	●	●	●	●	●	●				●	M	H	452	M
Respiratory therapists	●	●	●	●	●	●	●							M	H	11	L
Speech pathologists and audiologists	●	●	●	●	●	●								M	M	8	H

[1] Estimates not available.



Matching

World of Work continued

	Job requirements									Work environment			Occupational characteristics			
	1. Leadership/persuasion	2. Helping/instructing others	3. Problem-solving/creativity	4. Initiative	5. Work as part of a team	6. Frequent public contact	7. Manual dexterity	8. Physical stamina	9. Hazardous	10. Outdoors	11. Confined	12. Geographically concentrated	13. Part-time	14. Earnings	15. Employment growth	16. Number of new jobs, 1984-95 (in thousands)	17. Entry requirements
Health Technologists and Technicians																	
Clinical laboratory technologists and technicians			●		●		●			●			L	L	18	[1]	
Dental hygienists		●			●	●	●	●				●	L	H	22	M	
Dispensing opticians		●	●	●	●	●	●						M	H	10	M	
Electrocardiograph technicians		●	●		●	●	●						[1]	M	3	M	
Electroencephalographic technologists and technicians		●	●		●	●	●						[1]	H	1	M	
Emergency medical technicians	●	●	●	●	●	●	●	●	●	●			L	L	3	M	
Licensed practical nurses		●			●	●	●	●	●			●	L	M	106	M	
Medical record technicians					●						●		L	H	10	M	
Radiologic technologists		●			●	●	●		●				L	H	27	M	
Surgical technicians		●			●	●	●						L	M	5	M	
Writers, Artists, and Entertainers																	
Communications Occupations																	
Public relations specialists	●		●	●	●	●							H	H	30	H	
Radio and television announcers and newscasters	●	●		●	●	●					●		L	M	6	H	
Reporters and correspondents	●		●	●	●	●							[1]	M	13	H	
Writers and editors	●		●	●	●						●		●	[1]	H	54	H
Visual Arts Occupations																	
Designers			●	●	●	●	●							H	H	46	H
Graphic and fine artists			●	●			●								H	60	M
Photographers and camera operators			●	●		●	●						●	M	H	29	M
Performing Arts Occupations																	
Actors, directors, and producers			●	●	●	●	●	●				●	●	L	H	11	M
Dancers and choreographers			●	●	●	●	●	●				●	●	L	H	2	M
Musicians			●	●	●	●	●	●				●	●	L	M	26	M
Technologists and Technicians Except Health																	
Engineering and Science Technicians																	
Drafters					●		●				●			M	M	39	M
Electrical and electronics technicians			●		●		●							M	H	202	M
Engineering technicians			●		●		●							M	H	90	M
Science technicians			●		●		●							M	M	40	M

[1] Estimates not available.
[2] Vary, depending on job.

World of Work continued

	Job requirements									Work environment				Occupational characteristics			
	1. Leadership/persuasion	2. Helping/instructing others	3. Problem-solving/creativity	4. Initiative	5. Work as part of a team	6. Frequent public contact	7. Manual dexterity	8. Physical stamina	9. Hazardous	10. Outdoors	11. Confined	12. Geographically concentrated	13. Part-time	14. Earnings	15. Employment growth	16. Number of new jobs, 1984–95 (in thousands)	17. Entry requirements
Other technicians																	
Air traffic controllers		●	●	●	●		●			●				H	L	[2]	H
Broadcast technicians			●		●		●			●				M	H	5	M
Computer programmers			●		●					●				H	H	245	H
Legal assistants				[1]	●	[1]								M	H	51	L
Library technicians		●			●	●	●						●	L	L	4	L
Tool programmers, numerical control			●				●		●					M	H	3	M
Marketing and Sales Occupations																	
Cashiers		●				●	●				●		●	L	H	566	L
Insurance sales workers	●	●	●	●		●							●	M	L	34	M
Manufacturers' sales workers	●	●	●	●		●								H	L	51	H
Real estate agents and brokers	●	●	●	●		●				●			●	M	M	52	M
Retail sales workers	●	●		●		●							●	L	M	583	L
Securities and financial services sales workers	●	●	●	●		●							●	H	H	32	H
Travel agents	●	●	●	●		●								[1]	H	32	M
Wholesale trade sales workers	●	●	●	●		●								M	H	369	M
Administrative Support Occupations, Including Clerical																	
Bank tellers					●	●					●		●	L	L	24	L
Bookkeepers and accounting clerks					●						●		●	L	L	118	L
Computer and peripheral equipment operators			●		●		●				●			L	H	143	M
Data entry keyers					●		●				●			L	L	10	L
Mail carriers						●	●	●		●				M	L	8	L
Postal clerks					●	●	●	●			●			M	L	– 27	L
Receptionists and information clerks		●			●	●					●		●	L	M	83	L
Reservation and transportation ticket agents and travel clerks		●	●		●	●					●			M	L	7	L
Secretaries				●	●	●	●							L	L	268	L
Statistical clerks					●						●			L	L	– 12	L
Stenographers				●	●	●	●							L	L	– 96	L
Teacher aides	●	●			●	●	●	●					●	L	M	88	L
Telephone operators		●				●					●			L	M	89	L
Traffic, shipping, and receiving clerks			●	●	●									L	L	61	L
Typists							●				●		●	L	L	11	L

[1] Estimates not available.
[2] Less than 500.

Matching

World of Work continued

	Job requirements										Work environment			Occupational characteristics			
	1. Leadership/persuasion	2. Helping/instructing others	3. Problem-solving/creativity	4. Initiative	5. Work as part of a team	6. Frequent public contact	7. Manual dexterity	8. Physical stamina	9. Hazardous	10. Outdoors	11. Confined	12. Geographically concentrated	13. Part-time	14. Earnings	15. Employment growth	16. Number of new jobs, 1984–95 (in thousands)	17. Entry requirements
Service Occupations																	
Protective Service Occupations																	
Correction officers	●	●			●			●	●		●			M	H	45	L
Firefighting occupations		●	●		●	●	●	●	●	●			●	M	M	48	L
Guards						●	●	●	●		●		●	L	H	188	L
Police and detectives	●	●	●	●	●	●	●	●	●	●				M	M	66	L
Food and Beverage Preparation and Service Occupations																	
Bartenders				●		●	●	●			●		●	L	H	112	M
Chefs and cooks except short order				●			●	●			●		●	L	H	210	M
Waiters and waitresses				●		●	●	●					●	L	H	424	L
Health Service Occupations																	
Dental assistants		●			●	●	●	●					●	L	H	48	L
Medical assistants		●			●	●	●		●					L	H	79	L
Nursing aides		●			●	●	●	●	●				●	L	H	348	L
Psychiatric aides		●			●	●		●	●					L	L	5	L
Cleaning Service Occupations																	
Janitors and cleaners								●					●	L	M	443	L
Personal Service Occupations																	
Barbers						●	●	●			●		●	L	L	4	M
Childcare workers	●	●		●		●		●					●	L	L	55	L
Cosmetologists and related workers					●	●	●	●			●		●	L	H	150	M
Flight attendants		●			●	●	●	●						M	H	13	L
Agricultural, Forestry, and Fishing Occupations																	
Farm operators and managers	●	●	●	●	●		●	●		●				M	L	−62	L
Mechanics and Repairers																	
Vehicle and Mobile Equipment Mechanics and Repairers																	
Aircraft mechanics and engine specialists			●		●		●	●	●	●		●		H	M	18	M
Automotive and motorcycle mechanics			●			●	●	●	●		●			M	H	185	M
Automotive body repairers			●				●	●	●		●			M	M	32	M
Diesel mechanics			●			●	●	●	●		●			M	H	48	M
Farm equipment mechanics			●				●	●	●	●				M	L	2	M
Mobile heavy equipment mechanics			●				●	●	●		●			M	M	12	M

	Job requirements										Work environment			Occupational characteristics				
	1. Leadership/persuasion	2. Helping/instructing others	3. Problem-solving/creativity	4. Initiative	5. Work as part of a team	6. Frequent public contact	7. Manual dexterity	8. Physical stamina	9. Hazardous	10. Outdoors	11. Confined	12. Geographically concentrated	13. Part-time	14. Earnings	15. Employment growth	16. Number of new jobs, 1984–95 (in thousands)	17. Entry requirements
Electrical and Electronic Equipment Repairers																	
Commercial and electronic equipment repairers			●	●		●	●							L	M	8	M
Communications equipment mechanics			●	●		●	●							M	L	3	M
Computer service technicians			●	●		●	●							M	H	28	M
Electronic home entertainment equipment repairers			●	●		●	●		●				●	M	M	7	M
Home appliance and power tool repairers			●	●		●	●							L	M	9	M
Line installers and cable splicers			●		●		●	●	●	●				M	M	24	L
Telephone installers and repairers			●		●	●	●	●	●					M	L	−19	L
Other Mechanics and Repairers																	
General maintenance mechanics			●				●		●					M	M	137	M
Heating, air-conditioning, and refrigeration mechanics			●				●		●					M	M	29	M
Industrial machinery repairers			●				●	●	●					M	L	34	M
Millwrights			●				●		●					H	L	6	M
Musical instrument repairers and tuners							●							L	L	1	M
Office machine and cash register servicers			●	●	●		●							M	H	16	M
Vending machine servicers and repairers			●	●			●							[1]	M	5	M
Construction and Extractive Occupations																	
Construction Occupations																	
Bricklayers and stonemasons			●		●		●	●	●	●				M	M	15	M
Carpenters			●		●		●	●	●	●				M	M	101	M
Carpet installers			●		●	●	●	●	●					M	M	11	M
Concrete masons and terrazzo workers			●		●		●	●	●	●				M	M	17	M
Drywall workers and lathers			●		●		●	●	●					M	M	11	M
Electricians			●		●		●	●	●	●				H	M	88	M
Glaziers			●		●		●	●	●	●				M	H	8	M
Insulation workers			●		●		●	●	●					M	M	7	M
Painters and paperhangers			●		●	●	●	●	●	●				M	L	17	M
Plasterers			●		●		●	●	●			●		M	L	1	M
Plumbers and pipefitters			●		●	●	●	●	●	●				H	M	61	M
Roofers			●		●		●	●	●	●				L	M	16	M
Sheet-metal workers			●		●		●	●	●					M	M	16	M
Structural and reinforcing metal workers			●		●		●	●	●	●				H	M	16	M
Tilesetters			●		●		●	●						M	M	3	M
Extractive Occupations																	
Roustabouts					●		●	●	●	●		●		M	L	[2]	L

[1] Estimates not available.
[2] Less than 500.

Matching

World of Work continued

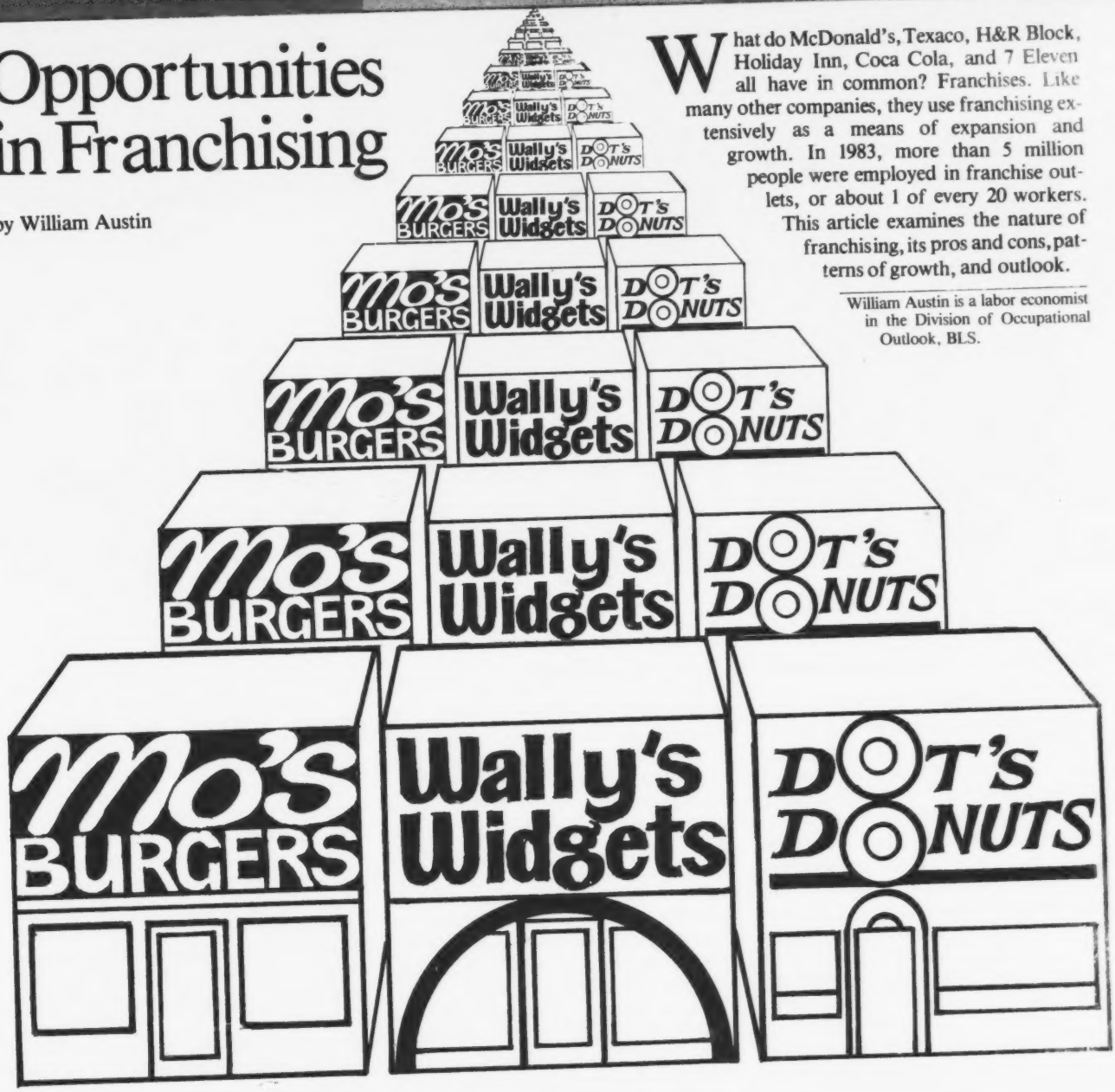
	Job requirements										Work environment			Occupational characteristics			
	1. Leadership/persuasion	2. Helping/instructing others	3. Problem-solving/creativity	4. Initiative	5. Work as part of a team	6. Frequent public contact	7. Manual dexterity	8. Physical stamina	9. Hazardous	10. Outdoors	11. Confined	12. Geographically concentrated	13. Part-time	14. Earnings	15. Employment growth	16. Number of new jobs, 1984–95 (in thousands)	17. Entry requirements
Production Occupations																	
Blue-collar worker supervisors	●	●	●	●	●		●		●					M	L	85	M
Precision Production Occupations																	
Boilermakers			●				●		●					M	L	4	M
Bookbinding workers		●			●		●	●	●		●			L	M	14	M
Butchers and meatcutters						●	●	●	●		●			L	L	−9	M
Compositors and typesetters							●	●	●		●			L	M	14	M
Dental laboratory technicians								●			●			L	M	10	M
Jewelers	●	●	●	●	●	●	●				●	●		L	L	3	M
Lithographic and photoengraving workers		●	●		●		●	●			●			H	M	13	M
Machinists			●				●	●	●		●			M	L	37	M
Photographic process workers							●				●			L	H	14	L
Shoe and leather workers and repairers		●			●	●	●							L	L	−8	M
Tool-and-die makers			●				●	●	●		●	●		H	L	16	M
Upholsterers							●	●			●			L	L	6	M
Plant and System Operators																	
Stationary engineers			●				●	●	●					M	L	4	M
Water and sewage treatment plant operators			●	●			●		●	●				L	M	10	M
Machine Operators, Tenders, and Setup Workers																	
Metalworking and plastic-working machine operators							●	●	●		●	●			L	3	L
Numerical-control machine-tool operators			●				●	●	●		●			M	H	17	M
Printing press operators		●	●		●		●	●	●		●			M	M	26	M
Fabricators, Assemblers, and Handworking Occupations																	
Precision assemblers					●		●	●			●			L	M	66	L
Transportation equipment painters							●	●	●		●			M	M	9	M
Welders and cutters							●	●	●	●				M	M	41	M
Transportation and Material Moving Occupations																	
Aircraft pilots			●	●	●		●				●			H	H	18	M
Busdrivers				●		●	●	●			●		●	M	M	77	M
Construction machinery operators					●		●	●	●	●	●			M	M	32	M
Industrial truck and tractor operators				●			●	●			●			M	L	−46	M
Truckdrivers				●			●	●			●			M	M	428	M
Handlers, Equipment Cleaners, Helpers, and Laborers																	
Construction trades helpers					●		●	●	●	●				L	L	27	L

Opportunities in Franchising

by William Austin

What do McDonald's, Texaco, H&R Block, Holiday Inn, Coca Cola, and 7 Eleven all have in common? Franchises. Like many other companies, they use franchising extensively as a means of expansion and growth. In 1983, more than 5 million people were employed in franchise outlets, or about 1 of every 20 workers. This article examines the nature of franchising, its pros and cons, patterns of growth, and outlook.

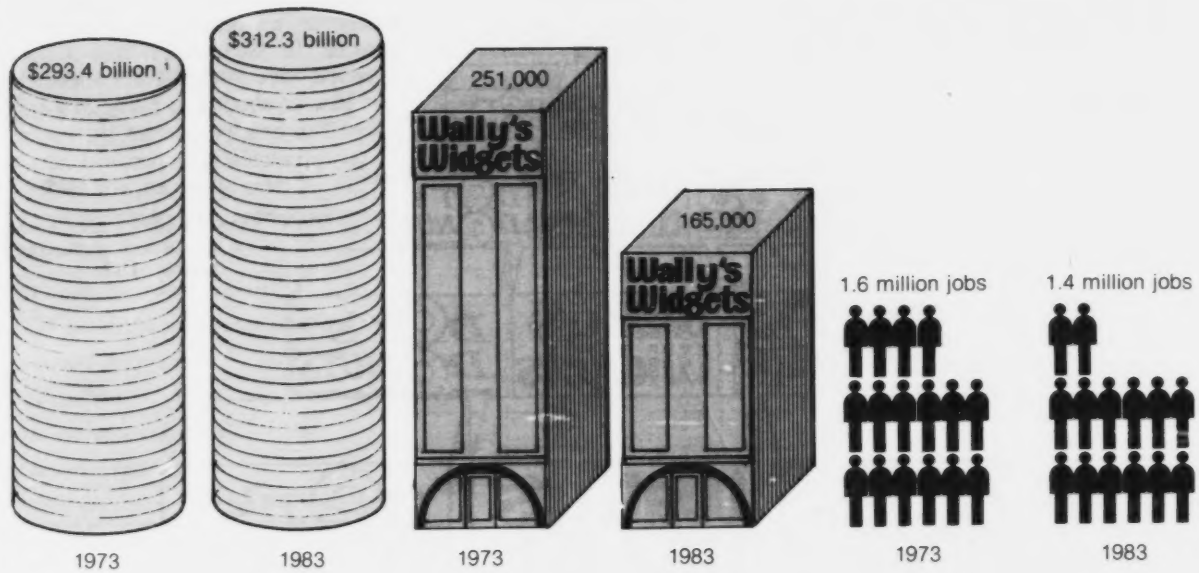
William Austin is a labor economist in the Division of Occupational Outlook, BLS.



Franchising

Chart 1.
Sales of product or tradename franchises grew slowly... as the number of firms plummeted... and employment declined.

(Each figure = 100,000 jobs.)



SOURCE: U.S. Department of Commerce.
[1] Sales in 1983 dollars.

The Nature of Franchising

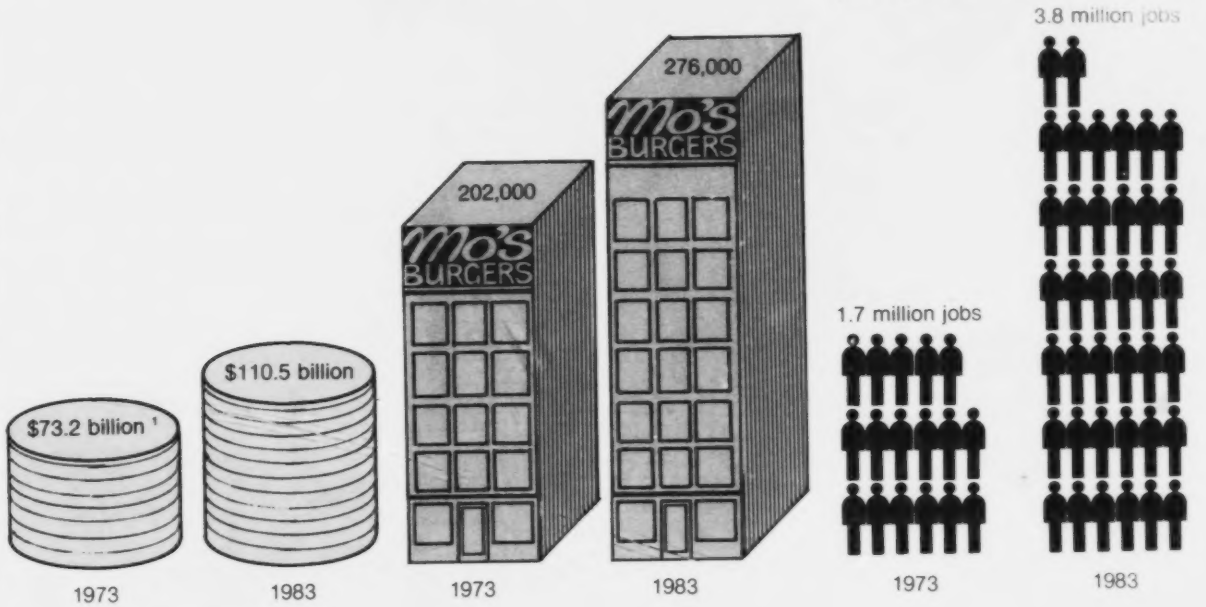
Franchising offers a way for established companies to expand their operations and increase their profits without assuming much additional risk. In exchange for helping people establish a business, the companies gain access to the financial resources of these small business owners. This allows the company to expand into more localities than it could on its own. As more outlets are created, the company profits from increased royalties as well as from increased sales of goods and services to the small business operator.

A franchise contract is a legal agreement between a company, known as the franchisor, and an individual or group, known as the franchisee. Basically, the franchisor sells the right to use the company's trademark, tradename, and even the format of the business to the franchisee in exchange for an initial fee and royalty payments (usually a set proportion of sales). Two types of franchise systems exist in the United States: Product or tradename franchising and business format franchising. When a business that is already operating becomes a franchise, it is called a conversion franchise.

Product or tradename franchising refers to a distribution system in which the franchisee is licensed to sell items manufactured by the franchisor. Some examples of this type of franchise are gasoline service stations, automotive dealers, and soft drink bottlers. This is the predominant form of franchising in the United States, accounting for over $312 billion in sales in 1983. As chart 1 demonstrates, however, sales volume has grown very slowly over the last decade, with resulting declines in the number of firms and employees.

Business format franchising is broader in scope than product or tradename franchising and usually includes a business format in addition to a product line or tradename. This format typically includes a marketing plan or strategy, a well-defined operating plan, and quality control.

Chart 2.
Sales of business format franchises soared . . . as the number of firms grew rapidly . . . and employment more than doubled.



SOURCE: U.S. Department of Commerce.
[1] Sales in 1983 dollars.

Business format franchising accounts for most of the growth in franchising since 1970 and is the most familiar type to consumers. These franchises accounted for over $110 billion in sales in 1983. As chart 2 indicates, sales volume as well as the number of firms and employees grew rapidly over the 10-year period. This type of franchising includes restaurants; nonfood retailers, such as hardware stores; convenience stores; personal services like hair salons; and business aids and services, such as personnel agencies and tax preparation services.

The success of business format franchising has given rise in recent years to conversion franchising. This occurs when an independent company converts to a franchise operation. For example, a local real estate brokerage firm may decide to affiliate with a national company, such as Century 21, in order to break into a wider market or to maintain its competitive position.

From Franchising to Self-Employment

The appeal of franchising is that it enables people without previous business experience—a major source of small business failures—to become their own boss. By having access to the managerial and financial resources of a large organization, individuals can reduce many of the risks associated with establishing a new business. And these risks are considerable! The Small Business Administration estimates that 2 of every 3 new businesses fail within 5 years. In contrast, the International Trade Administration estimates that only 2 or 3 of every 100 business format franchises are terminated each year.

Franchising is a relatively safe way to become self-employed for several reasons. Franchises generally offer a proven business format, a way of selling goods and services that is likely to succeed in any area. Most franchisors also offer extensive training programs that range from how to keep the books to how to hire and fire personnel. Other services

helpful to the newcomer may include site selection to insure maximum traffic, store design, and assistance in lease negotiations. Some franchisors even assist in arranging financing for the venture.

The franchisor continues to provide services to franchisees throughout the life of the franchise contract. Ongoing services vary among franchises, but typically include centralized purchasing to obtain quantity discounts and lower prices, quality control to ensure customers' satisfaction, market research to help meet customer preferences, advertising and promotion to expand the customer base, and refresher courses on various aspects of the venture. These services help the owner develop a clientele more quickly than an independent firm would.

Duties and Drawbacks

Regardless of the type of franchise, most franchises manage as well as own their business; thus, it is not surprising that they perform a wide variety of managerial tasks, ranging from keeping the books to supervising employees.

Occasionally, the franchise is owned by a group of investors and managed by a salaried employee; this practice is the exception rather than the rule, however, and is largely restricted to hotels and restaurants that have unusually large initial capital requirements.

The way franchisees spend their time differs by the industry in which they operate. In the restaurant industry, for example, an owner may spend his or her time supervising employees, maintaining records, ordering supplies, and even preparing food. This franchisee may work 60 to 70 hours a week. On the other hand, the owner of a personnel agency may spend the day interviewing prospective clients, talking to employers about job vacancies, and keeping the office running smoothly. This person is more likely than a restaurant owner to work a typical 40-hour week.

As these examples indicate, making the decision to franchise is not a matter to take lightly. A prospective franchisee—like any business owner—should carefully assess his or her abilities, values, and finances before

Franchising

making a decision. The accompanying box lists some important steps to follow when considering a franchise.

Not surprisingly, the benefits of franchising have a cost. One of the biggest drawbacks is the inflexibility of the franchise contract. Franchisees are legally required to adhere closely to the operating manual and business format of the franchisor. Deviation from the standard policy can lead to the termination of the contract. Innovative people who like to conduct business in their own way may not be happy with the typical franchisee-franchisor relationship.

The biggest drawback to starting any business, however, is the capital requirement. It is widely believed that it costs more to establish a franchise outlet than to establish a comparable independent business. The Commerce Department's annual survey on business format franchising reveals that the average initial investment ranged from $7,000 to $750,000 in 1983. Table 1 summarizes these data for a wide variety of franchises. The least expensive ones generally are those providing business and personal services—because relatively little equipment is required—while the most expensive, as one would expect, are hotels and restaurants.

The total investment in a franchise may encompass a wide variety of costs: An initial fee to establish the business, payments to the franchisor for leased equipment or real estate, and various fees for products and services. In addition, royalties are assessed on gross sales over the life of the contract.

Past Trends

Franchising's growth can be measured in any of three ways: By sales volume, employment, and the number of establishments. Table 2 summarizes these data for the period between 1973 and 1983.

During this period, sales volume increased throughout most segments of the

Table 1. **Average initial investment required for business format franchises in 1983**

Industry sector	*Average investment*
Accounting services	$ 21,000
Automotive products and services	75,000
Construction, home improvement, maintenance, and cleaning services	40,000
Convenience stores	130,000
Educational products and services	50,000
Employment services	48,000
Hotels, motels, and campgrounds	750,000
Printing and copying services	75,000
Restaurants	230,000
Retailing (food)	100,000
Retailing (other than food)	90,000
Tax preparation services	7,000

Source: U.S. Department of Commerce.

Table 2. **Percent change in sales volume, employment, and number of franchise establishments, 1973-83**

Type of franchise	*Sales volume*[1]	*Employment*	*Number of establishments*
Product or tradename franchises			
Automotive and truck dealers	-2	-8	-18
Gasoline service stations	22	-15	-35
Soft drink bottlers	27	4	-43
Business format franchises			
Automotive products and services	-15	1	-16
Business aids and services	225	438	209
Construction, home improvement, maintenance, and cleaning services	65	166	51
Convenience stores	49	81	44
Educational products and services	50	168	503
Hotels, motels, and campgrounds	46	54	18
Recreation, entertainment, and travel	285	122	123
Restaurants	102	163	63
Rental services, auto and truck	66	102	38
Retailing (food)	311	239	25
Retailing (other than food)	-24	-8	-34

[1]Percent change in sales was measured in constant 1983 dollars.

Source: U.S. Department of Commerce.

industry. In terms of employment and the number of establishments, however, a different picture emerges. There has been a dramatic reduction in the number of product or tradename franchises, notably automobile dealers, gasoline service stations, and soft drink bottlers. The number of gasoline service stations declined as the shift to self-service boosted productivity. Moreover, sales of cars and soft drinks have become increasingly dominated by large firms that can be operated more efficiently.

Business format franchises, on the other hand, have thrived during this period. Growth in sales, employment, and the number of firms has been especially strong in restaurants; business aids and services; recreation, entertainment, and travel services; and in construction, home improvement, maintenance, and cleaning services. Business format franchises—especially restaurants and recreation, entertainment, and travel services—have benefited from rising disposable incomes, derived largely from the growing number of dual-income households. Furthermore, as disposable incomes increase, families are less likely to spend time on routine household chores such as cutting the grass or cleaning the carpet—benefiting franchised construction, home improvement, maintenance, and cleaning services.

Low capital requirements in conjunction with a growing recognition of the benefits of franchising spurred growth in business aids and services. For example, the number of franchised accounting services has grown as more and more accountants have seen the benefits of affiliation with a national firm—extensive advertising, customer recognition, and data processing services.

In recent years, growth has been especially strong in convenience stores and in hotels, motels, and campgrounds. The growth in the number of franchised convenience stores reflects the change in shopping habits as more and more women entered the labor force. Men began to do more shopping and are more likely than women to patronize convenience stores. Increased personal and business travel has contributed to the growth of hotels and motels.

Before entering into a franchise contract, experts suggest you do the following:

1. **Examine your interests and abilities.** What do you like to do? What are you good at?
2. **Consult a directory of franchise opportunities.** A number of organizations publish information that includes descriptions of franchisor companies and the qualifications and capital that a franchisee needs.
3. **Narrow down your options.** Write to the companies that interest you and ask them to give you the names of franchisees that you could contact.
4. **Talk to franchisees.** Other franchisees can be a gold mine of information. They have firsthand experience at operating the type of firm that interests you.
5. **Consult a lawyer and an accountant before signing a franchise contract.** Franchise contracts usually last 10 to 20 years. Prospective franchisees should make sure that they understand all the details and ramifications of the contract.

Future Trends

The outlook for franchising depends in large measure on local economic conditions as well as wider acceptance by manufacturers, retailers, and service firms.

In recent years, business format franchising has profited by rising incomes and the large-scale entry of women into the labor force. These trends are expected to continue for the immediate future, and the growth in franchising can be expected to remain strong. Restaurants are expected to remain in the forefront of the franchise movement. Continued growth also is anticipated for security systems services, automotive maintenance and repair, video equipment and rental stores, travel agencies, home furnishings stores, maid services, and home repair services.

On the other hand, there is less certainty about the future prospects for product or tradename franchises. Some believe that the number of establishments will stabilize at 1983 levels, while others argue that the number of firms will continue to decline sharply.

In general, franchising has established itself as a viable marketing concept that is advantageous to both the franchisor and franchisee. Prospects seem favorable because an increasing number of firms are finding franchising to be an easy and relatively inexpensive way to expand, and franchisees benefit from their access to the financial and managerial resources of a larger firm.

As Mr. Andrew Kostecka of the Commerce Department summarizes, "Economic improvement, stable prices, a slower growing population, and increased competition for market share will turn many large corporations and managers to franchising." OOQ

JANUARY
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31
FEBRUARY
1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28
MARCH
1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
APRIL
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30
MAY
1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
JUNE
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30
JULY
1 2 3 4 5
8 9 10 11 12
15 16 17 18 19
30 31
AUGUST
1 2
8 9
15 16
22 23
29 30
SEPTEMBER
1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30
OCTOBER
1 2 3 4
8 9 10 11
16 17 18
24 25
31
1
8
16
23
30
DECEMBER
1
7 8
14
21
28 29

Temporary Jobs

by
Max L. Carey
and
Kim L. Hazelbaker

Temporary workers employed by temporary help firms—companies that send people from job to job—have become much more numerous in recent years. Their number almost doubled from 1982 to December 1985. In fact, the temporary help supply industry has been one of the fastest growing industries in recent years, growing at 8 times the rate for all nonagricultural industries. Although still small compared to such giants as the restaurant industry or local government, the temporary help industry now provides jobs for 735,000 workers. In addition, large numbers of workers hold temporary jobs without being employed by the temporary help services industry. Indications are that the rapid growth of the industry will continue through the mid-1990s.

This article is based on "Employment Growth in the Temporary Help Supply Industry," which appears in the April 1986 *Monthly Labor Review*. Max L. Carey is an economist in the Office of Economic Growth and Employment Projections, Bureau of Labor Statistics. Kim L. Hazelbaker formerly was an economist in the Office of Employment and Unemployment Statistics. Elinor W. Abramson and Daniel K. Wexler of these offices provided technical assistance.

How the Industry Works

Temporary workers in these firms actually only work for, and are paid by, one company, but their duties take them to various companies. Firms in the temporary help supply industry primarily engage in supplying other businesses with workers for periods ranging from a single day to several months. They recruit and screen applicants for temporary jobs, check references, administer tests to help determine qualifications, and sometimes provide training. They hire and fire, issue paychecks, withhold taxes, and make required employer contributions to programs such as unemployment insurance and social security. They also are liable under laws intended to protect the health and safety of workers and assure equal employment opportunities. The customer—the client firm where the worker actually performs the job—pays the temporary help supply firm and supervises the worker.

Many temporary help companies are very large firms, especially in the segment of the industry that places office workers. Customers need to have extremely quick action on the filling of clerical and other office jobs. Typically, orders are placed at least 1 day in advance, but some job orders are for personnel to report in a few hours. This quick turnaround necessitates a large and current file of clerical help available for almost instantaneous referral to customers' work sites.

Why People Become Temporaries

Workers choose to work for temporary help supply companies rather than regular employers for a variety of reasons. For some people, temporary jobs are a stopgap until they find a permanent job. Others seek temporary jobs because they want the schedule flexibility that will allow time for activities such as taking care of children or attending school. These jobs also attract retirees and others who want more leisure time. In addition, they can be a way of keeping skills up to date or trying a variety of employers.

Although people seeking temporary jobs often deal directly with employers, they may benefit from using the temporary help firm as an intermediary. Finding a job on one's own can be costly in terms of time and money; the cost may not be worth a job that lasts only a few days. Using a temporary help service can mean more time working and less time looking.

Temporary Jobs

Why Companies Use Temporaries

When a company's business increases or an organization grows, it usually hires more workers. In many situations, however, hiring a new employee for a permanent position is not in the best interest of the organization. For example, employers frequently need extra workers because of seasonal surges in business. The absence of regular employees because of vacation or illness may also create a need. Uncertainty about the economic climate also causes employers to prefer temporary workers in some cases. The use of temporaries may also be more efficient than overstaffing, the practice of employing a sufficient number of workers to meet peak demand.

Occupations

People usually seek temporary employment in one of the following four markets: Office, industrial, medical, or engineering and technical. Although a particular local office may serve both office and industrial workers, it is more likely to focus on a single market, especially if it serves medical or engineering and technical workers. Some of the large firms in the temporary help industry are involved in more than one market, but they usually have separate subsidiaries or divisions to deal with each.

Of these four markets, office is clearly the largest, according to the data available. Office occupations accounted for more than one-half of total employment in personnel supply services, industrial occupations almost three-tenths, and medical occupations about one-tenth. Only a small proportion of the employment was in engineering and technical fields. These data are only approximate, however, and may not reveal the full size of each market. The amount of temporary employment in engineering, for example, may be much greater than the data imply because many establishments that furnish temporary help in engineering and technician occupations are apparently classified in the engineering and architectural services industry rather than in the temporary help industry.

Office market. This market consists mostly of clerical workers such as secretaries, typists, receptionists, computer operators, and general office clerks. However, it also includes accountants and marketing and sales workers. Most industries use temporary office workers.

Many office jobs can be filled by temporary workers because the basic skills needed for particular occupations do not vary much from one employer to another. Customers usually are very specific about requirements for assignments. For example, in placing an order, a company may specify that it needs one typist skilled in preparing statistical tables to assist on a rush project and another who can type more than 60 words per minute to substitute for a regular employee who is recovering from an illness.

Many workers with office skills are not looking for regular full-time employment and are probably willing to trade slightly lower wages for increased flexibility. A large number are mothers who want to schedule work around family responsibilities. Some are school teachers who supplement their income by working during the summer. Others are recent college graduates who need some income until they find employment related to their studies. Temporary help firms try to ac-

commodate preferences for particular days or hours of work and the frequency or duration of assignments. Some employees of temporary help firms, however, are seeking permanent jobs, and their temporary assignments sometimes lead to these jobs.

Workers placed by temporary help firms must usually pass a series of tests of their clerical skills first. Experienced workers are especially sought after because customers usually cannot afford the time needed to train people for short assignments. In general, the temporary help firms do not train applicants either. However, when the local labor market is tight, some firms will sponsor clerical training classes in order to increase the pool of trained applicants. Some firms also provide basic and advanced instruction on word-processing equipment and personal computers.

The demand for temporary workers in office jobs generally is less sensitive to seasonal and cyclical changes than the demand for industrial workers and engineering and technical workers.

Employment in office occupations is expected to grow about as rapidly as total employment in the temporary help industry. As the industry's customers automate offices, however, temporary help firms should receive relatively more requests for such workers as computer operators, peripheral equipment operators, and secretaries and typists who can operate word processors and personal computers. At the same time, office technology may result in relatively fewer orders for file clerks, mail clerks, and data entry keyers. Some temporary help companies see potential in home-based offices for selected employees. Computerized equipment in the homes of these workers would enable them to transcribe material and produce printed copy in customers' offices miles away.

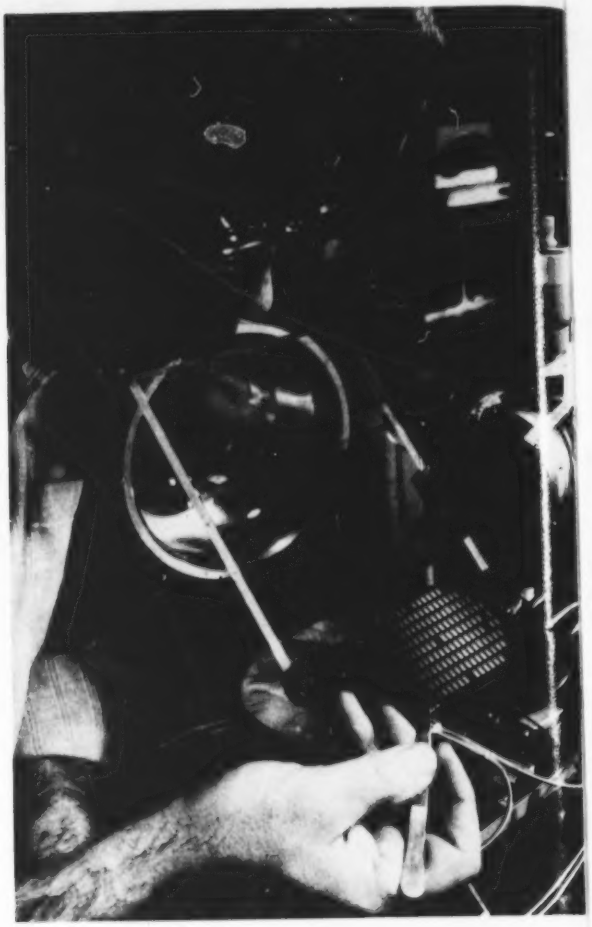
Industrial market. Helpers, laborers, material movers, and service workers, such as food and beverage preparation workers, make up a large proportion of the employees in this segment of the temporary help market. Other occupations include truckdrivers, machine operators and assemblers, and craft workers.

Little, if any, work experience is necessary for most of these jobs. Temporary workers in the least skilled jobs, however, frequently have much lower pay rates than regular employees in the same kinds of jobs, primarily because the temporary help firm must cover the costs of high turnover.

Although many of the industrial employees of temporary help firms are interested only in occasional employment, others see temporary assignments as stepping stones to higher paying regular jobs with the most desirable companies. Employers do hire temporaries who have demonstrated that they are good workers, but the demand for unskilled workers usually is much smaller than the number of people seeking the jobs. The demand for temporary workers in these occupations is also much more sensitive to seasonal and cyclical influences than is the demand for other temporary personnel.

Industrial jobs are expected to grow more slowly than temporary help employment as a whole. The demand for workers in these jobs depends significantly on orders from manufacturers. Employment in manufacturing is projected to rise at one-half the average rate of employment in all industries during the 1984-95 period. Some rapidly growing firms in high-tech fields may favor using temporaries because demand for their products can change very quickly. The long-term prospects in manufacturing probably are not favorable, however, since industrial workers generally have the kinds of jobs most susceptible to laborsaving technology. An increase in the demand for industrial temporary workers is expected to come mostly from other sectors of the economy such as construction and wholesale and retail trade.

Temporary Jobs



Medical market. Registered nurses and licensed practical nurses account for most of the medical employees in this relatively new segment of the temporary help industry. Some employees also are nursing aides, orderlies, and attendants.

Temporary help firms generally hire only registered nurses and licensed practical nurses who have a year or more of work experience in their occupations. Nurses may want to limit work in order to care for children, attend school, or simply to have more leisure time. In some cases, they work primarily to keep their skills up to date instead of for the income. On the other hand, there is a small number of nurses who have full-time jobs and moonlight through temporary help firms to supplement their income.

Data concerning the pay received by temporary workers versus permanent employees in the medical market do not indicate a regular pattern; in some occupations, temporaries appear to have higher wages than permanent employees, but they earn less than permanent workers in others. Some temporary help firms provide health insurance, life insurance, and other fringe benefits, but the benefits are less generous than those provided by hospitals and other institutions for their regular staffs.

The principal users of medical personnel supplied by the temporary help industry are hospitals, private households (for home health care), and nursing homes. The kinds of temporary workers needed and the period of their employment differ somewhat for each setting.

Temporary workers are needed by hospitals to fill in for regular employees—especially registered nurses—who are on vacation, ill, or absent for other reasons. A surge in a hospital's patient population as a result of an epidemic or disaster would increase the need for temporary personnel, too. In addition, temporaries have been used to alleviate shortages of registered nurses. Assignments may be for as little as one work shift, but they are more likely to be for 2 or 3 days, and some for even longer. Temporaries may get the least desirable shifts—evenings, nights, and weekends.

Medical workers are needed in private households to care for patients who have been released from hospitals to recuperate at home or who have become too sick or frail to care for themselves. Thus, registered nurses and licensed practical nurses, as well as nursing aides, orderlies, and attendants, may find temporary employment with private households. An assignment in a patient's home can be long term.

Nursing homes are similar to hospitals in their need for temporary workers and in employing them for only short periods. They are similar to private households, however, in the types of workers needed: Registered nurses, licensed practical nurses, nursing aides, orderlies, and attendants.

No matter the setting, the demand for medical temporary personnel is greatest during the summer, when many regular staff members take vacations and pa-

tients schedule elective surgery to coincide with their vacation time.

Future increases in the demand for temporary workers in medical fields are expected to be concentrated in nursing homes and private residences. The number of elderly and disabled people in need of long-term care is rising rapidly, which is increasing the demand for nurses in these settings. In addition, the early discharge of patients from hospitals means that more people will need medical assistance in nursing homes or their own homes. Many of them will need special equipment, such as respirators, that requires the supervision of a registered nurse.

Private residences are likely to account for more growth than nursing homes. Some temporary help firms have developed comprehensive programs for delivering a package of services to the home patient, including periodic visits by a registered nurse and basic care by licensed practical nurses and nurses' aides. Competition from visiting nurses' associations, nurses' registries, and other industries that provide home health care services, however, may limit the growth of temporary help firms in this market. Expansion may also be limited by a lack of employees who are willing to work in the evening, at night, and on weekends.

The outlook for temporary registered nurses in hospitals is not clear. Hospitals may become more dependent on temporaries in order to contain costs; many large hospitals, however, may prefer to operate their own temporary nurse pools.

Engineering and technical market. Engineers, designers, and nonmedical technicians such as drafters, engineering technicians, and computer programmers are employed by businesses that specialize in this segment of the temporary help market. A large proportion of the customers are in aerospace manufacturing, electronic manufacturing, ship building and repairing, and other industries that depend heavily on defense work. A variety of other manufacturing industries—including producers of automobiles, industrial machinery, and chemicals—and firms that contract to perform engineering services also are customers.

Firms in this segment of the temporary help industry are frequently called job shops or contract service firms. They usually seek to hire experienced personnel. Many job shoppers are single people in their late twenties and early thirties. Married workers, particularly those with children at home, are less likely to seek these jobs.

The need for engineers and technicians on a temporary basis usually arises as a result of major projects to develop new products or facilities. An aerospace company may need additional personnel, for example, to help design a new aircraft and get it into production on schedule. An engineering services firm may require extra help on a contract to design and build a new plant for a customer. Employers also may turn to temporaries when they are unable to recruit enough regular employees to staff a project. Relatively few engineers and technicians are employed temporarily to fill in for absent workers.

Engineers and technicians frequently can earn more take home pay in temporary jobs than they can in regular jobs. Fringe benefits, however, are usually limited to paid vacations, holidays, and medical and life insurance at group rates. Temporary workers also have less job security than regular employees.

Although high pay probably is the main reason engineers and technicians seek temporary jobs, the variety of assignments and geographic locations also may be an attraction. Not all of these workers are geographically mobile. "Freeway" or "subway" job shopper is industry parlance for the person who goes from one assignment to another in the same metropolitan area. A "road" job shopper is a person who is willing to relocate.

Engineering and technical firms are frequently able to anticipate their need for temporary personnel well in advance and can usually estimate how long they will be needed. Assignments are of a relatively long duration—6 months to 12 months is typical, and up to 2 years is not uncommon.

Job shops differ from the companies that provide office, industrial, or medical workers in the scope of their operation; they often place workers throughout the country or around the world, rather than concentrating on local markets. An office in Boston, for example, may recruit engineers from New England for a customer in Los Angeles. They also differ in that job shops generally do not select a particular worker for the customer; instead, they provide several resumes for the customer's consideration.

Employment of engineers and technical workers in temporary assignments may rise faster than total employment in the temporary help industry, at least through 1990. A large part of the growth in these jobs is expected to result from increased investment in capital equipment. An investment boom is projected because of expected lower real interest rates, the prospect of a stable economy, and the desire of manufacturers to take advantage of new technologies, purchases of which were postponed during the low-investment years of 1980-82. Growth also is expected in defense-related industries. Purchases of defense goods and services in constant dollars are projected to increase 5.3 percent annually between 1984 and 1990 and then taper off. This spending should increase the number of temporary jobs for product design and related activities in the aircraft and guided missiles, ordnance, shipbuilding and repair, and communication equipment industries.

Employment Interviewers

by Stephen Tise

Whether individuals are looking for a job or employers are seeking to fill a position, their success may depend on the assistance of an employment interviewer. Sometimes called an account representative, manpower development specialist, or personnel consultant, an employment interviewer helps jobseekers find employment and helps employers find qualified employees. Working largely in private personnel consultant agencies or State Job Service centers, employment interviewers act as matchmakers who put together the best combination of individual and job.

To accomplish their goal, employment interviewers obtain pertinent information from both employers and jobseekers.

Employers, who more often than not pay the agency for finding them workers, place a job order by providing a description of the job to be filled with a list of necessary qualifications such as education and experience. Determining the employer's precise needs can be a particularly challenging part of the interviewer's job, requiring that the employment interviewer visit the employer's facility to obtain additional information and a better understanding of the job being filled. Frequent telephone calls and visits also help identify the employer's future needs and help demonstrate that the employment interviewer is earnest about finding the best employee possible. Maintaining good relations with employers is an important part of the employment interviewer's job because it helps assure a steady flow of job orders.

Besides helping firms fill their needs, employment interviewers also assist individuals in finding jobs. The services they provide, however, vary according to the type of agency they are employed in and the clientele it serves. For example, some interviewers rely on an applicant's resume to provide them with the information they need about the person's skills, whereas others might have another staff member administer a test of some sort.

Employment interviewers in private agencies usually place job-ready individuals who need little in the way of extra training or improved job skills. Many interviewers work for agencies that specialize in placing applicants in particular occupations, such as secretary, engineer, accountant, attorney, or various medical specialties. Employment interviewers in the private sector—unlike those with government agencies—rarely provide any job-finding assistance other than occasional help in writing a resume. Their primary concern is insuring that job orders continue to arrive and that properly qualified workers are referred to the client.

Some employment interviewers in the private sector work for temporary help firms. These firms, which hire out their employees to firms needing temporary help, use employment interviewers to take job orders from client firms and match their needs against a list of available workers. (See "Temporary Jobs" elsewhere in this issue.) These employment interviewers evaluate and test an individual's capabilities as a rule. Determination of a worker's skills are usually made before hiring and kept on file for reference when filling job orders; the file is updated as the worker develops new skills. The employment interviewer notifies the qualified workers that jobs are available and refers them to the firms requiring assistance. Subsequent to the referral, the employment interviewer contacts the client firm to insure that the temporary worker was appropriately referred.

Stephen Tise is a labor economist in the Division of Occupational Outlook, BLS.

Interviewers

The Job Service

Employment interviewers in the public sector usually work for the State Job Service. Upon entering a Job Service center, an applicant will be given some forms to fill out requesting such information as level of education, job history, skills, awards, certificates, and licenses. An employment interviewer reviews these forms for completeness, legibility, and coherence before interviewing the applicant. The interview is designed to elicit information about the type of job being sought, the salary desired, and special needs—such as requirements for the handicapped—that must be met.

These employment interviewers typically place applicants who have few skills. In fact, applicants may need help in identifying the kind of work for which they are best suited. Some have no preference; in such cases, the employment interviewer evaluates their personal qualifications and either chooses an appropriate occupation or class of occupations in which they can be placed or refers them for testing to help identify their abilities. Other applicants have exaggerated expectations; in these cases, the employment interviewer must tactfully convince them that their requests for a particular job or salary are unreasonable.

Once an appropriate occupation is identified, the employment interviewer searches the file of job orders, seeking a possible opening, and refers the applicant to the appropriate employer should one be found. If no suitable openings are found, the interviewer instructs the applicant in the use of the public job listings, suggesting the applicant return every few days to review the listings when they are updated. An applicant who later finds a suitable opening returns to the employment interviewer, who must approve the possible match before making the referral.

Employment interviewers at Job Service centers may also provide help to jobseekers who need to develop their skills or refer people to training programs. The kinds of help rendered often vary from State to State. For instance, some States permit employment interviewers to provide counseling to troubled youths or applicants with personality problems, while others require that these individuals be referred to specially trained counselors. Employment interviewers may also coach individuals in such job-landing skills as interview techniques; in at least one State, mock interviews are videotaped, reviewed, and critiqued for the jobseeker. Employment interviewers in Job Service centers may also become involved in Equal Employment Opportunity (EEO) complaints.

Working Conditions

Employment interviewers usually work in comfortable, well-lighted, temperature-controlled offices. Work can be fast paced, especially in temporary help firms that supply clients with immediate help for short periods of time. Some overtime may be required, and use of personal transportation may be necessary to make employer visits.

Work is occasionally hectic, requiring an employment interviewer to juggle various duties, such as carrying on phone conversations, conducting interviews, and completing reports. Employment interviewers occasionally face the frustration of trying to place a difficult applicant or fill a particular job order. Ticklish situations occasionally arise when a distraught applicant becomes unruly or, infrequently, violent. These situations are usually confined to State Job Service centers.

Employment and Qualifications

In 1984, about 72,000 people held jobs as employment interviewers. Three out of five worked for employment agencies or temporary help firms in the private sector. Most of the rest worked for State and local governments.

Most agencies prefer to hire college graduates for their employment interviewer positions; however, a degree is not always a prerequisite. If one is, it can usually be in any subject, but a specific degree is sometimes required in private agencies specializing in placement of particular occupations like accounting or engineering. Courses in the social and behavioral sciences such as sociology, psychology, and counseling provide valuable training interacting with applicants.

Educational requirements in the private sector often reflect the firm's

management approach and the type of placements in which it specializes. Firms that limit themselves to placing individuals like accountants, lawyers, engineers, physicians, and executives often require their employment interviewers to have some training in the particular field. Thus, a bachelor's or even a master's degree becomes a prerequisite for a job as an employment interviewer working with these professionals. Firms placing less highly trained individuals, like word processors and secretaries, often require less education of their employment interviewers.

Employment interviewers in the public sector generally possess a bachelor's degree; some have a master's degree. However, this may merely reflect the large supply of available college graduates. Many States do not require a degree—often allowing substitution of suitable work experience for education. Suitable work experience may consist of public contact work or time in service at different jobs within a local Job Service center. In several States, clerical jobs may qualify as counting towards appropriate experience. Those with college degrees, however, are likely to have a decided advantage when competing for jobs. Special training is usually required of employment interviewers who counsel applicants. Training may consist of college courses in counseling.

All States and many large city and county governments use some form of merit system in hiring personnel for positions like those of employment interviewer. The merit system insures that only qualified individuals fill available positions. Qualifications are usually measured against a general standard through such methods as written examinations, interviews, and evaluations of education or experience as described on an evaluation form. Applicants should contact their State or local government for more information on examination or testing procedures.

Individuals who meet the qualifications are placed on a list of qualified candidates. Qualified candidates who actively seek out available openings have the best chance of finding a job.

Aside from educational qualifications, employment interviewers ought to have good communication skills, a desire to help people, office skills, and adaptability. A friendly, confidence-winning manner is an asset because personal interaction is a large part of this occupation. In fact, an energetic, natural salesperson might be preferred to a more highly educated individual who lacked these characteristics.

Advancement in the private sector can lead to progressively greater responsibility. Advancement as an employment interviewer in the public sector is often based on a merit system; promotions may be difficult to obtain above a certain level.

Job Outlook

Employment in this occupation is expected to grow much faster than the average for all occupations through the mid-1990's. Most growth will occur in the private sector among firms providing temporary help and personnel consulting services. Relatively little growth is anticipated in State Job Service centers, which employ most public sector employment interviewers. Many additional job openings will result from the need to replace individuals who retire or quit. The fast-paced, hectic nature of the private sector appears to result in faster turnover than is normally experienced in the public sector.

Most new positions for employment interviewers will result from rapid expansion of firms supplying temporary help services. Businesses of all types are turning to these companies to supplement their staff during busy periods; to provide specialized, short-term help; and to reduce the cost of the fringe benefits, such as sick and annual leave and health insurance, that are provided full-time employees.

Additional new positions for employment interviewers will result from expansion of the personnel consulting agency industry. As the economy continues to expand, increased job orders for new openings will occur—leading to greater demand for employment interviewers. Businesses that lack the time or resources to develop their own screening procedures will increasingly employ personnel agencies to find highly trained or specially skilled employees. The trend

Interviewers

toward increased job mobility has also contributed to higher levels of turnover, resulting in more placements. It is also possible, although by no means certain, that employment agencies will be used to a greater extent by firms competing for the declining number of 16-to 24-year-olds in the labor force.

Little if any job growth is foreseen in the public sector. The State-run but federally funded Job Service centers have recently experienced budget cuts, and current concern over attempts to return all funding responsibilities to the States has caused States to freeze employment at current levels. While little job growth is expected in the Job Service, it remains the second largest employer of interviewers and will require some replacements for those who retire or leave the occupation.

Local government agencies will offer a small number of job opportunities for employment interviewers. Community organizations such as drug and vocational rehabilitation centers occasionally use employment interviewers to develop jobs in which to place clients who are employable. Opportunities for interviewers in local government will vary according to the availability of funds.

Job prospects for employment interviewers within the private sector should be excellent through the mid-1990's. Little specialized education is required, making entry into this occupation relatively easy, except in those positions specializing in placement of lawyers, doctors, and engineers. A relatively rapid turnover rate, caused by both burnout and an inability to bring in job orders or make placements, will provide opportunities for those interested in a job as an employment interviewer. The continued expansion of the temporary help supply sector and personnel consulting agencies makes job prospects even more favorable.

Earnings

Private sector earnings vary widely. Most employment interviewers in personnel consulting agencies are paid a commission, that is, total earnings depend on how much business they bring in. Commissions usually vary by the type and number of placements. Placement of highly skilled or hard-to-find employees will obviously command a higher commission. An employment interviewer working strictly on commission often keeps around 30 percent of the client's payment, although this can vary from firm to firm. Some employment interviewers earn a salary plus their commission because they fill difficult or highly specialized positions requiring long periods of search. The salary, usually small by normal standards, guarantees these individuals security through slow times while the commission provides the incentive to increase one's earnings.

Some firms employ new workers for a probationary period of approximately 2 to 3 months, during which time they draw a regular salary. This provides new workers time to develop their skills and acquire some clients. At the end of the probationary period, the new employees are evaluated and are either let go or put on commission.

Most new employees earn between $18,000 and $23,000 per year, according to the limited data available; average earnings for experienced workers range from $25,000 to $45,000 per year.

Most employment interviewers in temporary help firms work for a salary. Starting salaries vary according to geographic location, earnings being highest in large cities. Starting salaries usually range between $12,000 and $18,000 a year.

Starting salaries for employment interviewers in State Job Service centers vary from State to State, ranging from $10,300 to $19,300 a year in 1985.

Related Occupations

Employment interviewers serve individuals and businesses. They take information and requests and provide services and help. Services provided by several other occupations, such as personnel officer and counselor, are similar to these, yet have important differences. Personnel officers work for a single firm and may help in the hiring of new employees but do not act as brokers for different organizations and never represent individual jobseekers; personnel officers may also have additional duties in areas such as payroll or benefits management.

College career counselors are similar to employment interviewers in that they help individuals find jobs. However, their primary duties are in student development, helping new students choose their major and arrange a proper class schedule. A master's degree is usually the minimum educational requirement for a position as a college career counselor.

Counselors in community organizations and vocational rehabilitation facilities also help clients find jobs, but their primary duties are usually something other than being a job finder. Individuals seeking assistance from these organizations usually have more than employability problems and need help for conditions like drug abuse or alcohol dependency.

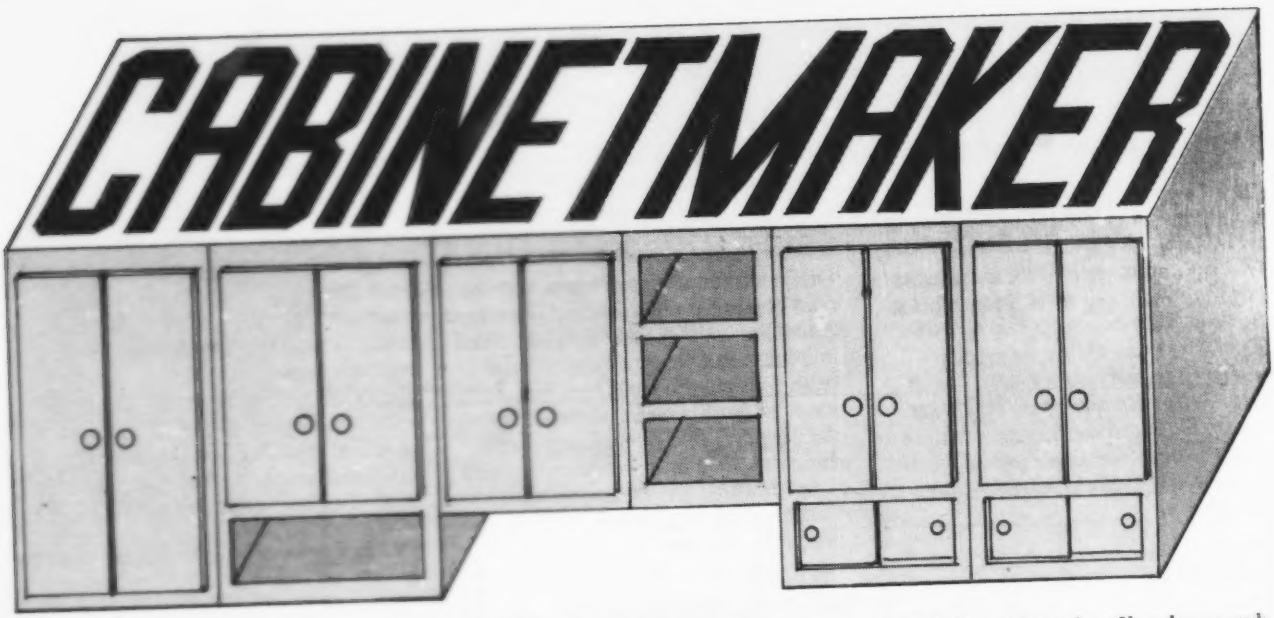
Others who also do similar work include insurance agents and brokers, claim takers for both insurance and unemployment benefits, and retail sales workers.

Sources of Additional Information

Information on a career as an employment interviewer is available from

National Association of Personnel Consultants
1432 Duke St.
Alexandria, Va. 22314.

You're a **What?**



In an industrial park on the outskirts of Washington, D.C., adjacent to a municipal airfield, you can find David Hartman's workshop. The backdrop of brick and blacktop seems an unlikely setting for a cabinetmaker, which is what Hartman is. But step into his shop, and any doubts you may have are quickly dispelled.

The cold concrete outside contrasts sharply with the warm, wood-paneled interior. The office furniture is of handcrafted cherry, the color of a rich cup of coffee flavored with cream. Even some simple office accoutrements are made of wood—atop a desk sits a tape dispenser of smoothly carved poplar. The smell of sawdust is in the air, and the muffled din of power tools emanates from the workroom.

Presiding over these sights, sounds, and smells, in blue jeans and flannel shirt, is David Hartman, whose clear eyes and deliberate, reflective manner bespeak a master craftsman.

OOQ: How long have you been working with wood?
Hartman: For more than 20 years. Initially it was an avocation. For about the last 15 years, it's been my profession. I came to Washington hopeful of finding a job in furniture design or graphics. But I discovered that what was needed was someone to do the actual work, to build the pieces. So I opened a small shop.

OOQ: Do you have a degree in design?
Hartman: No, I studied architecture for a few years.

OOQ: What's the difference between cabinetmaking and furniture making?
Hartman: When speaking of hand crafted wood furniture, there's really no difference. From my perspective, it's a question of semantics.

OOQ: Were you building custom cabinetry from the beginning?
Hartman: It was mostly carpentry at first, but little by little I began to branch out. I built a small end table for a customer who not long after became a partner in a local law firm. He commissioned me to design and build the desk, credenza, and tables for his office. His father-in-law, who's also a lawyer but with another firm, saw my work and liked it. He hired me to do some work for his firm. Since then I've done work for a number of other law firms in the area.

OOQ: Washington is a lawyer-laden city. It seems to be a pretty good idea to cater to that community.
Hartman: It's not unusual for a cabinetmaker to specialize like that. An associate of mine does quite a bit of work for banks. In a certain respect, the work I do is reflective of the designers and architects I work with. Many cabinetmakers work regularly with certain designers who are their staple clients. I do many other jobs, but it's important to have those contacts if you're going to have a viable business.

OOQ: Do you design many of the pieces that you build?
Hartman: I don't do quite the number that I used to do or that I would like to do, actually. But building a successful business sometimes conflicts with personal desires. Anything that takes all of my time, as the special commissions do, usually provides a much lower return. Jobs of a fairly routine nature, such as simple bookcases, which we can produce quickly and in greater volume, provide a greater income for the shop.

Michael Stanton, the OOQ's staff writer, interviewed David Hartman.

OOQ: That must be frustrating sometimes.
Hartman: Sure it is; but, unfortunately, economics forces compromises.

OOQ: What do you think is the most important skill for an aspiring cabinetmaker to have?
Hartman: I wouldn't say that it's necessarily a question of skill, but of aptitude. I think you must be able to conceptualize, to see in your mind's eye how a piece of furniture should fit together. I don't think that this can be taught.

OOQ: But basic woodworking skills can be taught.
Hartman: Of course they can. When I was starting my business I frequently hired people with no experience. It was a question of necessity. I couldn't afford to pay experienced workers. I think woodworking is pretty much an 'employee's market.' It's rare that you can find a career woodworker available. They're usually in business for themselves. Woodworkers are pretty individualistic.

OOQ: What about traditional training programs?
Hartman: If you mean the classical apprentice program where a young person learns the craft at the master's elbow, those are long gone. For a person to receive that kind of formal, extensive training, he would almost have to work for free. People have to earn a living. Today's trade schools might provide rudimentary skills, but there is still very much to learn.

OOQ: You mentioned aptitude as the most important quality for an aspiring cabinetmaker. What are some other valuable skills?
Hartman: People have to enjoy working with their hands. We use a wide variety of tools, such as chisels, drills, saws, and lathes, so a person should have some facility with them. A person's attitude is very important. It's a job that requires a lot of patience and attention to detail.

OOQ: Should a person know how to read blueprints and technical drawings?
Hartman: That's a skill that can come in handy. But we don't always work from finished drawings here in the shop. In many cases, it depends upon the designer. I've worked with some designers for quite a while and we talk through ideas. I've even worked from sketches on cocktail napkins. It's important to be able to communicate clearly and take direction well.

OOQ: Have you ever built models before beginning a project?
Hartman: I have, but not frequently. It depends upon how clear an idea I get from the client. Sometimes a model is a last resort.

OOQ: Does all of your work take place in the shop?
Hartman: No. Much of our work is custom made, designed for a particular space in an office or home, so it's not assembled here in the shop. We install all of our work and sometimes have to make minor adjustments.

OOQ: What about finishes and polishes? Do you do that work also?
Hartman: Yes, but to be frank, I think that is one of our weak spots. I believe that other cabinetmakers will say that, too. It's difficult to get just the right finish for a piece of furniture. I believe our finishes are as good as any produced commercially but we can still improve. I want a piece to be perfect, and that's a nearly impossible standard to achieve.

OOQ: What kind of living can a person make?
Hartman: In my shop, a person with little experience can earn about $5 an hour. A worker with reasonable experience can make about $8. I have paid some people $10 an hour.

OOQ: What do you enjoy most about your job?
Hartman: There are several things, actually. I've always enjoyed working with my hands and the shop gives me plenty of opportunities for that. The intellectual process of design and the practical aspects of construction are continually stimulating. And on top of it all, I enjoy being my own boss.

OOQ: What about some of the frustrations?
Hartman: One that I alluded to earlier is the constant reconciliation between business and craft. Often I have to make a decision prompted by economics. We have very high standards in the shop, but sometimes I just have to say a piece is "good enough." It's also frustrating to work with clients who are unspecific. It's rare that we increase the price of a job because of changes requested by the customer. I feel honor bound to do the job at a quoted price.

OOQ: What advice would you give to a young person interested in cabinetmaking?
Hartman: What I've given you is a picture of my shop. No doubt there are similarities and differences in other shops, but there is no systematization. I don't know of a single place where a person can gain all the skills one needs to become an accomplished cabinetmaker. The only way to do it is by getting a breadth of experience in a variety of jobs. It takes a long time to become exposed to new ideas and ways of doing things and even longer to incorporate these ideas into your own work. Even experienced cabinetmakers learn something new every day. We learn new ways to join pieces, for example, or are exposed to new and exotic woods. It's a constant challenge. OOQ

Is the Occupational Outlook Handbook sometimes too much of a good thing?

Try reprints!

All sections of the 1986–87 *Occupational Outlook Handbook* are available in reprint form. Reprints are especially useful for jobseekers who want to know about a single field and for counselors who need to stretch the contents of a single Handbook among many students.

The titles of all 21 reprints are listed here.

Price of reprints: $1.25 each. A complete set costs only $22. Use the order form provided. (Note: A discount of 25 percent will be allowed on purchase of 100 or more copies of a single reprint when mailed to a single address.)

Make all checks payable to the Superintendent of Documents.

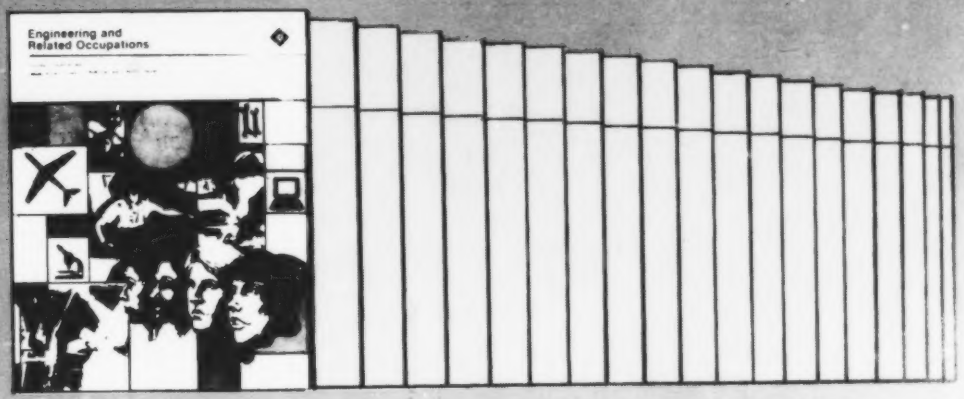
Credit card orders must be sent directly to the Superintendent of Documents.

Mail other orders to:

Bureau of Labor Statistics
Publications Sales Center
P.O. Box 2145
Chicago, IL 60690

or

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402



Order Form

Please send the following reprints from the 1986–87 *Occupational Outlook Handbook*

Bulletin No.	Title	Quantity	Price
2250–1	Tomorrow's Jobs: Overview		
2250–2	Business, Managerial, and Legal Occupations		
2250–3	Engineering and Related Occupations		
2250–4	Computer and Mathematics-Related Occupations		
2250–5	Physical and Life Scientists		
2250–6	Education, Social Service, and Related Occupations		
2250–7	Medical, Dental Practitioners, and Assistants		
2250–8	Dietetics, Nursing, Pharmacy, and Therapy Occupations		
2250–9	Health Technologists and Technicians		
2250–10	Communications, Design, Performing Arts, and Related Occupations		
2250–11	Technologists and Technicians, Except Health		
2250–12	Sales Occupations		
2250–13	Clerical and Other Administrative Support Occupations		
2250–14	Protective Service Occupations and Inspectors		
2250–15	Service Occupations: Food, Cleaning, Health, and Personal		
2250–16	Mechanics, Equipment Installers, and Repairers		
2250–17	Small Business Occupations		
2250–18	Construction and Extractive Occupations		
2250–19	Metalworking Occupations		
2250–20	Production Occupations		
2250–21	Transportation and Material Moving Occupations		
	Set of 21 reprints		
		Total price	

☐ Enclosed is a check or money order payable to the Superintendent of Documents

☐ Charge to GPO Account No

☐ Charge to ☐ VISA ☐ MasterCard ☐ CHOICE

Account No Expiration date

Name

Organization (if applicable)

Address

City, State, and Zip Code

U.S. Department of Labor
Bureau of Labor Statistics
Washington, D.C. 20212

Official Business
Penalty for Private Use, $300

Second Class Mail
Postage and Fees Paid
U.S. Department of Labor
ISSN 0199-4786

30/4

OOQ

OCCUPATIONAL OUTLOOK QUARTERLY

U.S. Department of Labor
Bureau of Labor Statistics
Winter 1986

EDUC
FILE ROOM
NEWARK PUBLIC LIBRARY

Where the Workers Are: A State-by-State Guide to the Labor Force in 200 Occupations

L2.70/4:

U.S. Department of Labor
William E. Brock, Secretary

Bureau of Labor Statistics
Janet L. Norwood, Commissioner

The ***Occupational Outlook Quarterly*** is published four times per year by the Occupational Outlook Service, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212. Second-class postage paid at Washington, D.C., and at additional mailing offices. **Postmaster:** Send address changes to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

For Sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Subscription price $5 domestic, $6.25 foreign; single copy $2 domestic, $2.50 foreign. Two-year subscriptions are available for $10.

Editor's Note: Articles contributed by authors outside the U.S. Department of Labor do not necessarily represent the views of the Department. Questions on occupational and career information should be sent to Inquiries and Correspondence, Bureau of Labor Statistics, GAO Building, Washington, D.C. 20212. Communications on editorial matters should be addressed to the Editor, Occupational Outlook Quarterly, Bureau of Labor Statistics, Washington, D.C. 20212. Phone: (202) 272-5298.

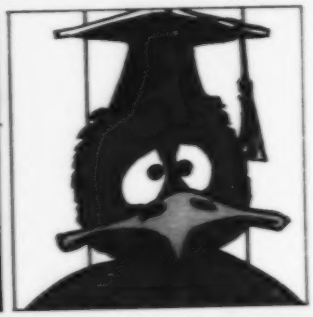
The Secretary of Labor has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department.

ISSN 01994786

Bureau of Labor Statistics Regional Offices

Boston	John F. Kennedy Federal Bldg. Suite 1603 Boston, Mass. 02203	Phone: (617) 565-2327
New York	Suite 3400 1515 Broadway New York, N.Y. 10036	Phone: (212) 944-3121
Philadelphia	P.O. Box 13309 Philadelphia, Pa. 19101	Phone: (215) 596-1154
Atlanta	1371 Peachtree St. NE. Atlanta, Ga. 30367	Phone: (404) 347-4418
Chicago	9th Floor Federal Office Bldg. 230 South Dearborn St. Chicago, Ill. 60604	Phone: (312) 353-1880
Dallas	Federal Bldg. 525 Griffin St., Room 221 Dallas, Tex. 75202	Phone: (214) 767-6971
Kansas City	911 Walnut St. Kansas City, Mo. 64106	Phone: (816) 374-2481
San Francisco	450 Golden Gate Ave. Box 36017 San Francisco, Calif. 94102	Phone: (415) 556-4678

P.2



P.12

P.18

P.33

OCCUPATIONAL OUTLOOK QUARTERLY
Winter 1986
Volume 30, Number 4

Melvin Fountain, *editor*
Neale Baxter, *managing editor*
Michael Stanton, *staff writer*
Richard Mathews, *art director*

NEWARK PUBLIC LIBRARY
DEC 19 1986
U. S. GOVT. PUBS.
DEPOSITORY 376

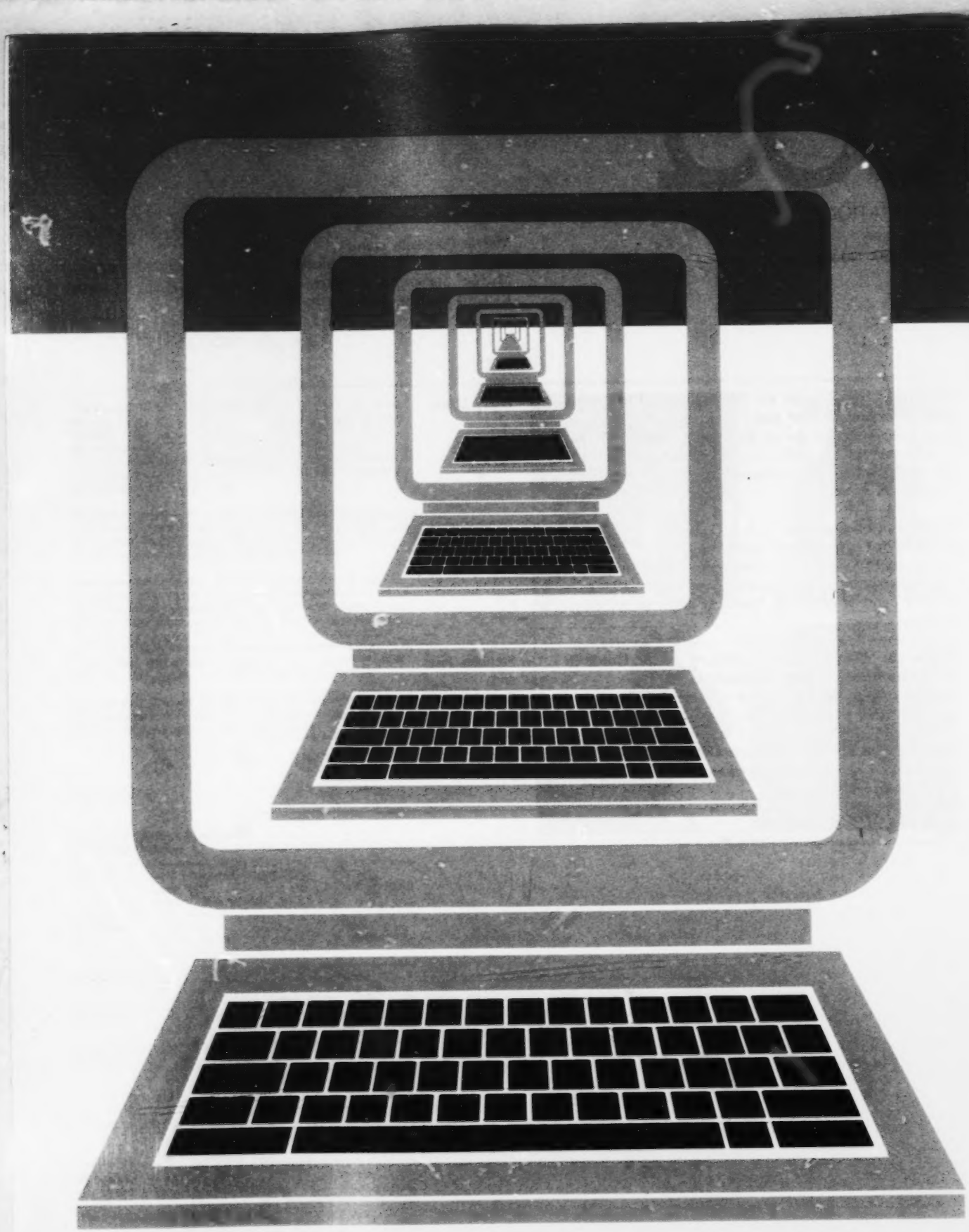
The Outlook for Computer Professions: 1985 Rewrites the Program — Larry Drake — 2
Some people used to act as though the computer boom could never end. In 1985, they worried that it had ended for good. Now it looks as though growth is likely but competition is too.

Teachers' Job Outlook: Is Chicken Little Wrong Again? — Daniel Hecker — 12
Employers of teachers have had their pick of job candidates for several years—for so many years, in fact, that a balance between supply and demand might even look like a shortage.

Where the Workers Are: A State-by-State Guide to the Labor Force in 200 Occupations — Stephen Tise and David Frank — 18
We are often asked where most workers in a particular occupation live. Here's the answer.

You're a What? Chef Proprietaire — Michael Stanton — 33
Did you ever wonder what the finest restaurants have that a fast food place does not?

Grab Bag — 36



The Demand for Computer Professions:

1985 Rewrites the Program

by Larry Drake

Rarely do occupations flourish as the computer professions have. Since 1970, when the Census Bureau began tracking the number of programmers—who write instructions for computers—and systems analysts—who devise ways to use the equipment—employment has grown dramatically. Because of high demand, workers in these relatively new occupations could change jobs frequently, lured by fatter paychecks as employers outbid each other for scarce talent. Many believed that things would only continue to improve. However, 1985 brought a rude awakening. That year, the computer industry experienced a serious and widespread slowdown in sales. This slump led to the first significant wave of layoffs ever for programmers and systems analysts.

This development raised questions in many people's minds about the future of these occupations:

- What caused the events of 1985?
- Will growth in these professions continue?
- What education and training are now required?
- Is an associate's degree still adequate preparation for some jobs?
- How do people advance in these occupations?
- What areas of the computer field are growing?

Larry Drake is a labor economist in the Division of Occupational Outlook, BLS.

One important trend was clearly intensified by the slowdown in 1985: Graduates of junior college programs who learn COBOL will continue to find jobs, but employers will increasingly seek college graduates when filling positions for computer programmers and systems analysts.

Causes of the Slowdown

The rate of growth in these occupations has been almost unparalleled. The Census Bureau reports that, from 1970 to 1985, employment of programmers grew nearly 7 times as fast as the economy as a whole. Employment of systems analysts grew even more rapidly, almost 10 times as fast as the economy as a whole. Sales of computers grew just as quickly (chart 1). Hence the surprise of many when sales in 1985 fell short of expectations. Never had so severe a slowdown hit the computer industry.

Experts have now identified several causes for the drop in demand for new equipment in 1985, including the general business climate and developments in the computer industry itself.

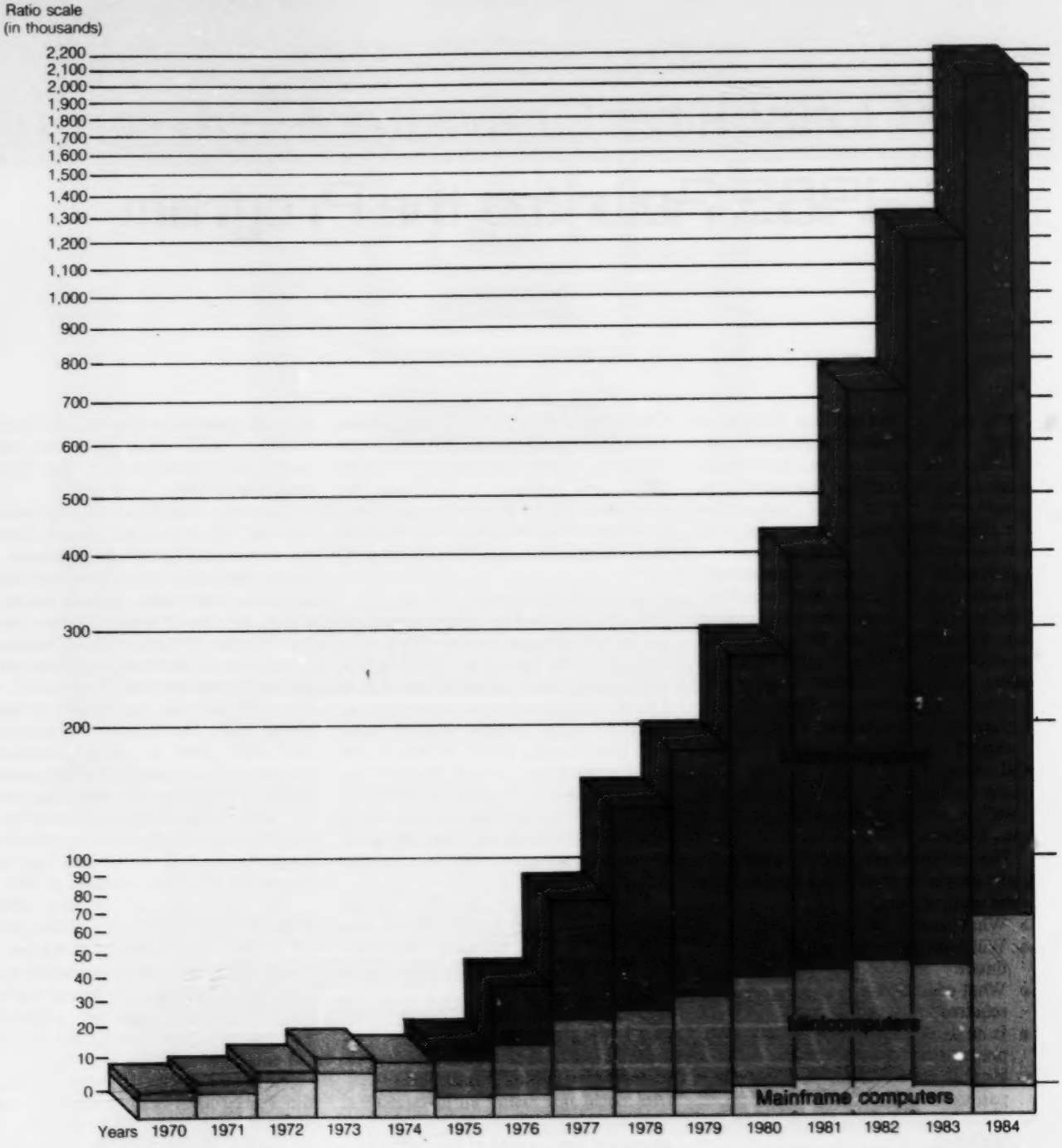
Overall economic conditions influenced the fortunes of the computer industry in 1985. Certain sectors of manufacturing were in a recession and executives could not justify an investment in new computer equipment. Other business executives were unsure of the direction of the economy and took a cautious approach toward major investments, such as computers. Also, the dollar was then at its peak strength in international money markets, which made American computers more expensive to foreign buyers and reduced sales.

Dynamics within the computer industry itself also contributed to the slump. Vastly increased domestic competition, as well as competition from Japan and other countries, was a factor, as more and more companies moved into a lucrative market. Between 1981 and 1985, for example, the number of American companies making microcomputers rose from 8 to 47. At the same time that the number of companies rose, the thirst for computers slackened. Sales of home computers dropped off as many people discovered that they really had no compelling need for them. In addition, the popularity of video games—which are run by computer programs—turned out to be a fad, and the market for them collapsed in 1985.

The record sales of the early 1980's themselves also led to some of the falling off in 1985. Many companies wanted to ensure that the computer equipment they had already purchased or leased was being properly used. That is, companies were trying to digest the equipment they had already acquired.

The diversity of computer products also slowed sales. Some consumers were confused by the vast array of products on the market. By the mid-1980's, the technological revolution in office machines had produced an impressive array of automated equipment. In addition to the

Chart 1. **Sales of computers shipped in the United States, 1970-84**



[1] Microcomputers exclude units with a list price less than $1,000.

SOURCE: The Computer and Business Equipment Manufacturers Association.

whole line of computers—from mainframes to PC's—and their peripheral equipment such as printers, there were dedicated word processors, facsimile machines, intelligent copiers, and optical character recognition equipment. The problem facing many managers was how to make a coherent, productive system out of these components, instead of just an assortment of unrelated, isolated machines. This puzzle has yet to be completely solved and stands as a challenge to the computer industry. Its lack of resolution was one of the key factors slowing industry growth in 1985. Still other potential buyers found that the equipment was not as user friendly or versatile as they needed. Some of the products most desired by business leaders—such as effective data communications hardware and software—were not sufficiently developed. Tantalized by manufacturers' advertising claims about forthcoming machines or software that was even more powerful and sophisticated, these companies also postponed making decisions.

The interaction of these developments led to pay cuts, unpaid overtime, hiring freezes or slowdowns, temporary plant shutdowns, and widespread layoffs throughout the computer industry in 1985. The layoffs hit employees at all levels, including programmers and systems analysts. If fewer businesses buy computers, fewer systems analysts are needed to adapt computers to the needs of business, and fewer programmers are needed to write software.

Job prospects for programmers and systems analysts had been changing even before the 1985 slowdown, however. Competition had grown steadily for entry level positions. This reflected the growing supply of qualified applicants, resulting from the rapid expansion of computer training programs at all levels. From on-the-job training programs in corporations to associate's degree programs in community and junior colleges to bachelor's degree programs in universities, the number of programs expanded dramatically, setting off explosive growth in the number of people receiving training, particularly since the turn of the decade. According to figures from the Department of Education, for example, the number of bachelor's degrees awarded in computer and information science more than tripled in just 5 years, rising from 7,224 in 1978 to 24,506 in 1983; the number of associate's degrees in fields such as data processing technologies and computer programmer technologies also rose sharply, reaching 27,085 by 1982 (chart 2). In addition, college graduates from other curriculums swell the supply stream for the computer professions more each year. Graduates in mathematics, engineering—especially electrical and electronic—accounting, business and management, and economics enter computer occupations, according to Department of Education data.

It appears, from the rise in supply and the less sharp rise in demand for computer programmers and systems analysts, that these two occupations have reached a new stage in their development. A growing number of these workers are experiencing difficulty in finding work. As economists say, what had been a seller's market for some skills has become a buyer's market. Steven Dubnoff, of the Boston-based Center for Survey Research, expresses a familiar theme when he says, "The job market in the Boston metropolitan area for entry level COBOL programmers has crashed. They used to be able to walk in off the street and get a job right away. That's no longer the case."

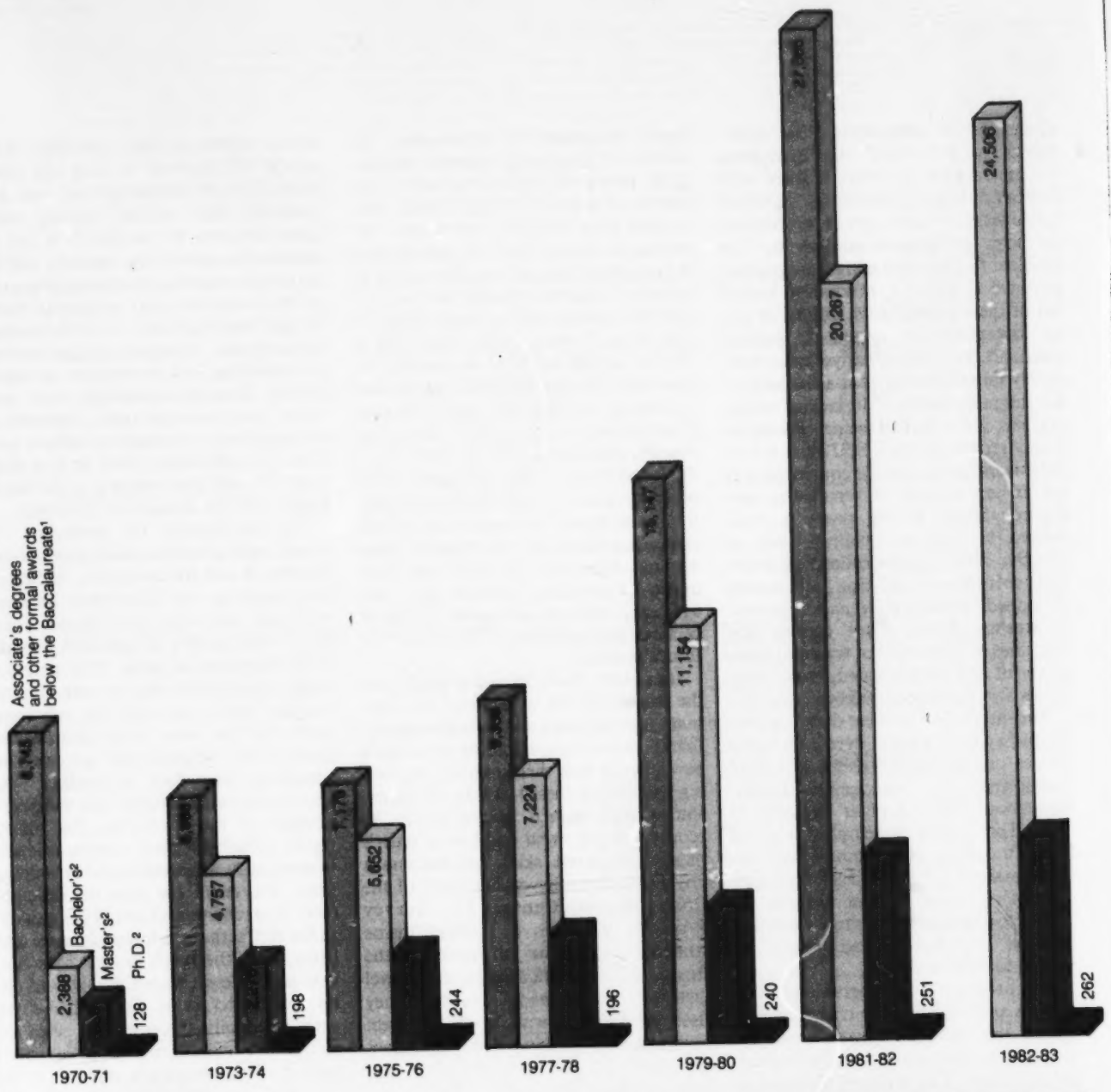
1985: A Faulty Harbinger

Most analysts view the recent slump as temporary and expect computer sales to pick up and continue at a healthy rate, although probably not quite as robustly as in the early 1980's. The consensus among experts is that computer companies will continue to turn out computers that are increasingly user friendly, powerful, and versatile, making them more attractive to customers. A key to sustained growth in the industry will be the implementation of industry standards so that computers and peripherals from various manufacturers can be connected into networks. There is particular interest in connecting microcomputers to mainframes, because companies want end users—such as accountants, economists, and engineers—to be able to retrieve data from the mainframe, work on it at their own PC's, and then return it to the mainframe with the changes incorporated.

The justification for projecting renewed rapid growth is the ever-increasing number of uses for computers. Although computers do not solve every business problem—as new purchasers soon learn—the number of solutions they do offer continues to grow. This development is intimately tied to technological change. Twenty years ago, the only computers in use were large mainframes. Since then, technological advances in computers have been astounding. The key to such rapid progress was the development of the microchip, the silicon wafer containing tiny computer components such as memory and processing units. The result has been the development of an entire spectrum of computers. In the 1970's, the minicomputer came into being, while the 1980's saw the introduction and widespread proliferation of the microcomputer, or PC. For a while, there were essentially three distinct sizes of computers—mainframes at the high end, mid-sized minicomputers, and PC's at the low end. As technology has further developed, however, these distinctions have become blurred. Micro, supermicro, mini, supermini, mainframe, and super computers are now available.

As the variety of computers has grown so has the number of computer applica-

Chart 2. **Degrees in computer and information sciences, selected years, 1970-71 to 1982-83**



¹ Includes data processing technologies, general; keypunch operator and other input preparation technologies; computer programmer technologies; computer operator and peripheral equipment operation technologies; data processing equipment maintenance technologies; data processing technologies, other. Data for 1982-83 not collected.

² Includes computer and information science, general; computer programming; data processing; information sciences and systems; systems analysis; computer and information sciences, other.

SOURCE: U.S. Department of Education.

tions. The mainframes of the 1960's primarily were used by large establishments to crunch numbers for such tasks as payroll and accounting. Now, typists revise documents at word processors, economists run regression analyses on desk-top computers, hospital nurses monitor patients' progress with PC's, and ticket agents sell reserved seats at countertop terminals linked to mainframes. About 1 worker in 8 now uses a computer as part of a daily work routine, according to a recent study. (See "Computer Training and the Workplace" in the Winter 1985 *OOQ*.) All indications point to this trend continuing, which will greatly stimulate demand for programmers to write the original software, for other programmers to maintain it, and for systems analysts to integrate it into systems.

Although programmers who develop software often receive the most publicity, there are just as many who maintain existing software. These workers keep programs current by modifying, enhancing, and upgrading them. If a business adds a new line of products, for example, the appropriate programs must be altered to reflect this change. This is a time-consuming process; in fact, establishments generally spend more on maintaining software than on creating or purchasing it. As more computer systems are installed, the need for maintenance programmers should grow correspondingly.

Not all experts agree that the growth in the number of applications will result in a corresponding rise in demand for computer professionals, particularly programmers. Some point to the rising productivity of programmers, others to the proliferation of canned software, and still others to the growing use of workers in foreign countries as forces that will reduce the demand for programmers.

Some analysts believe that, with productivity tools, programmers will become so productive that fewer of them will be needed. These tools include both software and hardware (though mainly the former) and go by names like development workbenches, program generators, and fourth-generation languages. In essence, they are programs to write programs. They allow programmers to concentrate on the more difficult, challenging work and leave routine work to be done automatically by machine. For example, an inventory control form can be developed by simply describing the necessary parameters, such as titles of categories and amount of required storage space. The program then develops the rest of the application, rather than the programmer writing out every last detail. Other analysts point out that, while it is true that programmers using these tools are more productive, this enhanced productivity is limited to the more routine and predictable tasks. Inasmuch as the world is constantly changing and new, unexpected problems are continually arising, programmers will always be needed. It is logical to expect that the productivity tools will continue to be refined and made more sophisticated. However, because it is impossible to anticipate every contingency, these tools can never totally replace programmers. In the final analysis, these observers say, there is no substitute for the technical expertise of a good programmer.

In a similar vein, some analysts argue that as more canned software is developed, there will be less need for programmers to write customized software and consequently fewer will be needed. Their critics respond by saying that while there has been an explosion of packaged software in recent years, this has not been translated into a softening of demand for programmers. The reason is that as the end users master the packaged programs, they tend to want to develop more sophisticated and specialized programs geared specifically to their individual needs. This is where the programmers come in, either to write and maintain the programs or to show the end users how to do it. Many such end users want the more complex applications, but are not willing to spend all the time necessary to learn programming. Therefore, in this view, the demand for programmers for this purpose will continue and should grow in relation to the growth in the number of end users. As Rich Peterson, of INPUT, a market research firm, comments, "In the long run, advances such as fourth-generation languages and packaged software could well end up creating more demand for programmer services. This is because once people know how to use these things on a PC, they want more, like extra storage space, faster processing speed, and other enhancements, for which they usually need the help of programmers."

Only time will tell which prediction is more accurate. Even if productivity tools and packaged software do lessen demand somewhat for computer professionals, there is general agreement that these two occupations will still be among the fastest growing in the economy. One point seems indisputable: Programmers and systems analysts will be around for a long time.

A third concern is the use by American companies of workers overseas. In the post-World War II period, we have watched numerous United States manufacturers shut down plants in this country and move them abroad, seeking lower labor costs. More recently, we have seen clerical, lower level computer jobs going overseas; specifically, various U.S. companies maintain in several foreign countries data entry operations that are linked electronically to the United States. Now we are observing signs of this pattern extending to computer professionals. A few U.S. companies already have contracted out programming work to firms in India, where programmers earn a fraction of what their American counterparts earn. It is too soon to tell if these developments pose a real threat to the long-term employment prospects of computer pro-

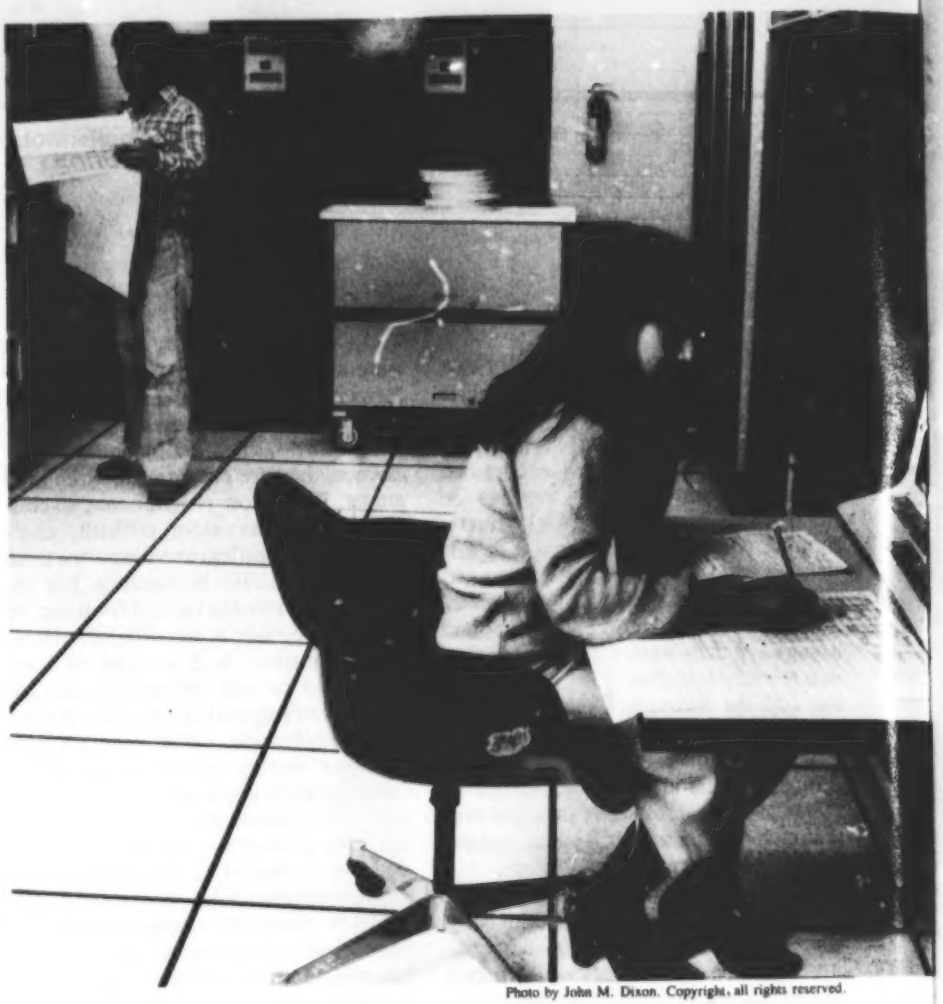


Photo by John M. Dixon. Copyright, all rights reserved.

fessionals in the United States. However, there are several obstacles to moving these jobs abroad. The lack of a common language—natural, not computer—tends to limit the field to English-speaking countries. In addition, close interaction between programmers and customers usually is necessary to write and debug programs, something made much more difficult and expensive if the programmer and customer are in different countries. A final limitation is that experience in a given field and work environment often is needed to tailor programs to the customer's exact specifications. While any prediction on this subject is risky, few experts anticipate that this phenomenon will have a major adverse impact on the employment of computer professionals in the United States during the coming decade.

What then does the future hold for these occupations? According to the Bureau of Labor Statistics' latest set of employment projections to 1995, only one occupation in the entire economy—paralegal—is expected to grow faster than programmer and systems analyst. Taken together, employment in these two occupations is expected to grow about 70 percent—about 4 times as fast as the labor force—and provide over 40,000 new jobs annually. This is in addition to the many more job openings created each year by computer professionals who transfer to other occupations or leave the labor force for one reason or another.

Education and Training To Match the Competition

In reaction to the expanding supply of computer professionals, employers have become much more selective in hiring. Many place particular emphasis on applicants' previous experience in the field, so that they can avoid in-house training, thus saving time and money. Employers also look for evidence of problem-solving skills and the ability to communicate effectively, both orally and in writing. Applicants also improve their chances if they are knowledgeable about the employer's field and have the skills or training appropriate to that field. As a consequence, the more challenging and lucrative programmer positions increasingly require a bachelor's degree, raising the question of the usefulness of the associate's degree.

Although a bachelor's degree is increasingly desired for programmer positions, numerous job opportunities still exist for programmers with less training. Many organizations are retaining existing systems because of the enormous costs associated with changing them. Therefore, many banks, insurance companies, and other large organizations continue to need COBOL programmers to maintain their massive computer systems. Graduates of these programs who can demonstrate solid COBOL skills should qualify for these jobs. In addition, graduates of 1- or 2-year training programs working as programmers can improve their marketability in various ways. Besides picking up new skills on their regular job, they can take advantage of any on-the-job training offered by their employer. They can learn new programming languages and skills by taking classes offered by a technical school, college, or university. Classes also are offered by computer and software companies, retail computer stores, and user groups (users of a particular brand or model computer). Home study also can be fruitful.

Besides the continued demand for programmers who know COBOL and FORTRAN, the two most widely used computer languages, employers are now seeking programmers who have mastered one or more of the 200 or so other languages in use, such as ADA, Pascal, C, LISP, and FOCUS. Other positions require knowledge of one of the operating languages that are used to write the systems

Photo by Robert V. Eckert. Copyright, all rights reserved.

software that coordinates the various components of the machine. The principal operating languages are MSDOS, UNIX, MVS, and VAX/VMS. Programmers who know systems software will be in considerable demand as establishments move to integrate all their computers into one overall network. Applicants for programmer positions who know both programming and operating languages, especially if the languages are closely related—as in the case of C and UNIX, for example—have significantly improved chances of landing the job they want.

Systems analysts generally need a bachelor's degree in computer or information science. Knowledge of some computer languages and previous experience as a programmer rate highly in the eyes of most employers, as well as knowledge of the environment in which computers are used.

As mentioned before, employers are looking particularly for hands-on experience when hiring programmers and systems analysts. Therefore, it behooves prospective computer professionals to seek work where possible in their chosen field in addition to getting the appropriate formal education. Various options exist. A summer or part-time job in a data processing department is one. Another is a college work-study program. An internship program also is a possibility. The point is to actually do computer-related work, work as closely related as possible to one's field, in order to complement one's studies. For example, a student interested in computer-aided design/computer-aided manufacturing (CAD/CAM) could seek a summer job with a company that produces or uses this technology.

Advancing in Computer Occupations

There are excellent opportunities for advancement into management for computer professionals who demonstrate a thorough understanding of the organization's operations and a managerial orientation. This is directly related to the more central role that computers are coming to play in today's business world. Reflective of this trend is the growing status accorded departments responsible for data processing and management information systems. Computer professionals who combine technical expertise with business acumen have very bright career prospects.

Quite a few computer professionals have used a job in the public sector as a stepping stone to a higher paying one in the private sector because government salaries, while generally competitive at entry levels, lag behind at higher levels. These professionals take entry level positions with local, State, or Federal Government agencies, work there for a few years, and then leave for a private sector job at a substantially higher salary. Needless to say, such turnover has caused problems for government agencies.

Some Growing Computer Fields

Certain areas of computer application are expected to experience particularly strong growth in the coming decade, including services, defense, data communications, and artificial intelligence. People who wish to work as programmers or systems analysts would do well to pay particular attention to them.

Services. Nearly 2 out of every 3 new jobs for computer professionals through the mid-1990's will occur in the services industry. Software houses, computer consulting firms, and temporary help services firms will be especially important to computer programmers and systems analysts.

Companies that specialize in writing programs are often referred to as software houses. They write programs for all sizes and types of computers. Some of the software they produce is packaged, to be sold in retail outlets. Other software is produced for a specific application, such as recordkeeping in a hospital. The number of such firms mushroomed during the

1980's, spurred in large measure by the development and proliferation of PC's. Thousands of software houses are small, with a handful of employees, mostly programmers, but a few employ hundreds of workers and play a dominant role in the market. Employment of programmers is expected to grow significantly in software houses over the coming decade as the number and type of computer applications continue to expand, requiring more software.

Job opportunities should also be good for programmers and systems analysts in computer consulting. The number of information management consultants has been growing rapidly in recent years and is expected to continue to do so for the foreseeable future. These consultants—many of whom formerly worked for large companies and then decided to go into business for themselves—work on a contractual or retainer basis. They aid establishments on a wide range of computer-related matters. For example, they may suggest what hardware and software to use; they may help install systems and train people to run them; or they may provide support services, such as maintenance and repair.

Several factors are driving employment up in this area. Some companies want computer services but find that developing and maintaining a full-time, in-house staff for that purpose is too costly, inconvenient, or time consuming. Other companies want additional expertise in a specific area of their computer operations. Others need help in integrating computers into their operations. Some consultants specialize in specific areas, such as factory automation or data communications, while others are all-round troubleshooters. In fact, a major attraction of a consulting job is the opportunity to deal with a variety of work situations.

The temporary help industry also is expected to provide employment for an increasing number of programmers and systems analysts, for reasons similar to those spurring the growth of consulting firms. Computer professionals employed by temporary help agencies, often called job shops, are sent out to other companies to meet demand during peak periods or to complete projects requiring special skills. When the particular assignment—which usually lasts several months to several years—is completed, the temporary goes to the next assignment. This enables firms to avoid the cost and disruption of hiring and laying off permanent staff.

Some workers prefer this arrangement. They have more freedom to choose when to work, develop skills, expand professional contacts, and gain experience in a variety of work settings, which increases their worth in the job market. Nevertheless, working for a job shop can have its drawbacks. While their pay is usually competitive with that of their counterparts in permanent positions (or even better at times), temporaries do not receive the same fringe benefits, like vacation and sick leave, health insurance, and a retirement plan. Nor are they able to acquire tenure in a firm, thus limiting their upward mobility.

Defense. Government spending on military projects creates jobs for programmers and systems analysts. Modern weapons systems employ computers extensively and require the services of many computer professionals. For example, the Strategic Defense Initiative alone could require up to 100 million lines of programming, making it the biggest software project in history. The Defense Advanced Research Project Agency sponsors many computer projects, such as the Strategic Computing Program, which has the goal of developing extremely advanced artificial-intelligence and computer-processing technologies.

Programmers and analysts have three ways to become employed in military-related areas: Enter the Armed Forces as an officer; work as a civilian in the Defense Department—20,000 computer specialists do; or work for a corporation that has defense contracts.

Data Communications. One of the biggest challenges facing programmers and systems analysts is to link up all the computer systems within individual establishments, companies, or government agencies and to link these institutions' computers to the outside world.

The last two decades have witnessed many technological advancements in computers and communications equipment. For example, computer data now can be transmitted by telephone and telegraph lines, FM radio waves, microwaves, satellites, coaxial cables, and fiber optics. This development should have the effect of augmenting demand for programmers, because software will be needed to permit each kind of transmission. Similarly, demand for systems analysts should grow in response to the need to integrate these new forms of data transmission into systems.

A growing number of computer professionals are working to ensure the connection of stand-alone microcomputers to large mainframes. The goal is to allow the end user to retrieve, or download, data from the mainframe and use it on a PC. This connection also allows data to be entered into the mainframe from the PC. This networking has many variations and is referred to by various terms, some of the most popular being local area network (LAN), wide area network (WAN), and multiuser system.

Programmers and systems analysts dealing with networks are employed in various settings. Some work for computer manufacturers that produce the hardware; others work for software houses; still others work for consulting firms; and the remainder install and maintain such networks in user establishments.

Currently, data are transmitted in digital or computer form, but increasingly

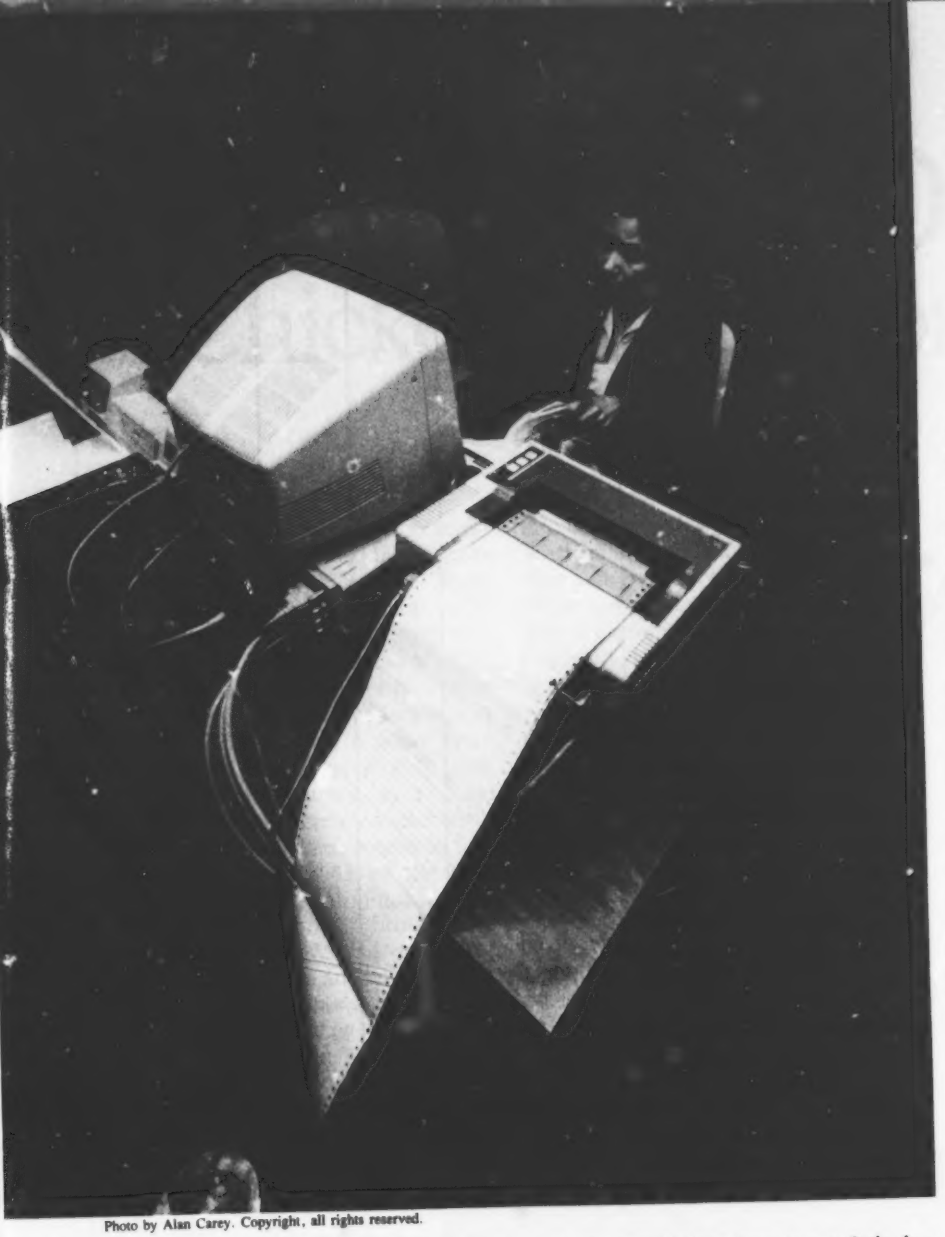


Photo by Alan Carey. Copyright, all rights reserved.

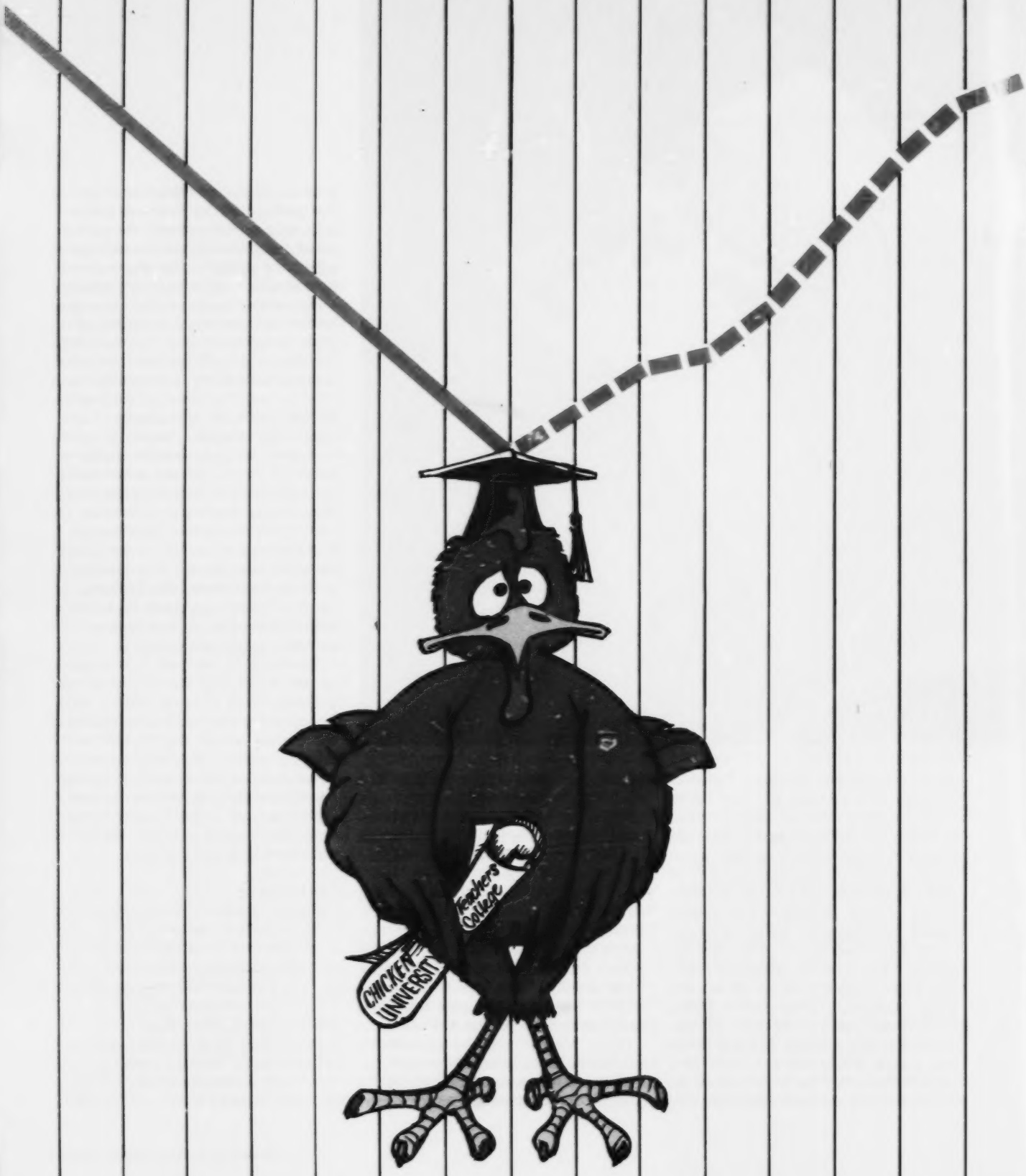
there will appear networks that can transmit data in voice or video form. These emerging networks are referred to as integrated services digital networks (ISDN's). In a likely future scenario, a corporate executive in Boston and another in Dallas are connected through an ISDN. Sitting at their desk-top work stations (which sometimes are called integrated voice data terminals, IVDT's), they exchange ideas over the telephone while they jointly perform various calculations using a spreadsheet program. In addition to exchanging data in the form of numbers and letters, they can exchange charts and graphs. Thus, they can carry on a conversation while they both work on the same material at their respective terminals, permitting them to use their time much more productively. Such new technologies are expected to increase the demand for computer professionals because they will need to be programmed and integrated into systems.

Artificial Intelligence. A growing number of firms are specializing in artificial intelligence (AI), the effort to get computers to think like people. This goal will require a tremendous amount of creative research and analysis because the human brain is exceedingly complex and duplicating its thought processes is extremely difficult. While scientists have not made a final breakthrough, they have made progress. The most prominent example of this progress is the development of expert systems. These are computer programs that guide people to resolve certain kinds of problems. For example, there are expert systems that help physicians diagnose patients by asking the physician a series of questions and suggesting likely diagnoses. Programmers begin building an expert system by interviewing a variety of experts on a given subject. They then distill the experts' knowledge into a set of if-then rules, building a knowledge base from it. Next, they structure the program so that it asks the user a series of questions. The program takes the user's responses and puts them through a sequence of logical operations that manipulate and combine the rules in the knowledge base to produce an answer for the user. The development of expert systems, complex though it is, is only one facet of the work being carried on in the field of artificial intelligence. In addition, research is being conducted on robotics, speech recognition, vision systems, and natural language processing.

The field of AI does not currently employ many programmers and systems analysts, simply because it is so small. However, it is expected to grow rapidly in the coming decade and provide an increasing number of jobs. One possible result, however, of successfully developing AI is that the programs may be used in some cases rather than human programmers and systems analysts, tending to hold down their employment.

The Future

Computerization is touching ever broader facets of our everyday life. As a result, demand for computer professionals to help guide this process is expected to grow very rapidly in the coming decade. Despite the anticipated increase in competition for available positions, the future is bright for persons wanting to become programmers and systems analysts, provided they obtain the proper education and work experience.


Teachers College
CHICKEN UNIVERSITY

Teachers' Job Outlook: Is Chicken Little Wrong Again?

by Daniel Hecker

Reports of teacher shortages, many accompanied by forecasts that shortages will worsen, have been numerous in the past several years. One article describes a school district's inability to find a qualified physics teacher; another speaks of the need for those who can teach English as a second language; a third claims that teachers in almost every subject are in short supply. But, these news items to the contrary, most school districts had enough certified teachers in most teaching specialties, according to a study conducted in 1983 by the U.S. Department of Education. Furthermore, the Nation's vigorous, broad-based education reform movement will almost certainly contribute to an increase in the supply of teachers. Shortages seem unlikely, at least according to the usual definition of a shortage. Much depends, of course, on whether standards, salaries, and student-teacher ratios remain similar to those that currently prevail.

Does One Vacancy Make a Shortage?

Whether a shortage or surplus of teachers exists partly depends on how these words are defined. The term "teacher shortage" generally describes a situation in which fewer certified teachers—those meeting State-specified standards—are available than schools want to employ at existing wages. A surplus exists when certified teachers are unable to find a position.

Does a shortage now exist? At the risk of being overly simplistic, the answer is no. This does not mean that every school can fill every vacancy with a certified teacher. In reality, teaching is too diverse an occupation to be described accurately in terms of shortages or surpluses. Conditions vary widely by specialty, region of the country, and degree of urbanization. Teachers are certified for particular subjects and grades; consequently, teachers in one specialty may have trouble finding jobs at the same time that schools cannot find enough teachers in another specialty. Nor does the geographic distribution of prospective teachers match up with the distribution of jobs; and many teachers are not willing to move from surplus to shortage regions, so these imbalances persist. Also, teachers generally prefer suburban schools to inner-city and rural schools, so suburban schools can be turning down qualified applicants while central cities and rural schools can't attract them. The question, therefore, is not whether a shortage or surplus exists but where do shortages and surpluses exist—in what regions and what fields.

Daniel Hecker is a labor economist in the Division of Occupational Outlook, BLS.

Shortage? Yes! Shortage? No!

A survey of the demand for new teachers conducted in the fall of 1983 by the U.S. Department of Education indicated that shortages of certified teachers were confined to certain school districts or teaching assignments and that most school districts had no shortages in any teaching field. It found that there were only two vacancies per thousand teachers and that less than 2 percent of all teachers in public schools lacked regular certification in their principal field of assignment. In private schools, where State certification is not always required, 16 percent were uncertified. About 9 percent of newly hired public school teachers (21 percent of private) were uncertified in their principal field.

As expected, some shortages were evident with regard to particular specialties, regions of the country, and degree of urbanization. The greatest shortages in public schools were for bilingual education teachers, with 12 percent of all teachers uncertified; the next greatest shortages were in computer science, special education, and vocational education, with 4 percent in each. Only 2 or 3 percent of all science and mathematics teachers were uncertified. By region of the country, the proportion of uncertified teachers among those recently hired in public schools ranged from 2 percent in the North Central region to 12 percent in the Northeast. As for degree of urbanization, 7 percent of the newly hired teachers in the suburbs of metropolitan areas were uncertified and 14 percent of those in central cities were.

These survey data are several years old. Since 1983, there have been a number of reports of teacher shortages in the press. School systems in the central cities of metropolitan areas—Baltimore, Houston, and Los Angeles, for example—have hired some uncertified teachers because they couldn't get enough certified candidates. Press reports rarely indicate, however, whether these shortages made up a small or a large proportion of openings. Furthermore, such reports do not necessarily point to the existence of a nationwide shortage because, as noted, central cities of large metropolitan areas generally have more difficulty attracting certified teachers than other districts do. Nor does the need for suburban school districts to recruit harder and be less selective than a few years ago point to a shortage, for these districts have generally filled all their positions with certified applicants by the first day of school. This situation probably fits the definition of a balance.

The situation for math and science teachers illustrates the difficulty in interpreting evidence about shortages. There has been a flood of reports about a significant shortage of mathematics and

Teachers

science teachers. However, reports showing that there is no shortage have also been numerous. In a 1984 report, the U.S. General Accounting Office concluded that sufficient information was not available to determine if net nationwide shortages of math and science teachers existed or if the quality of teachers had declined.

Are Shortages Likely To Develop?

Given that the supply of teachers now appears to be in balance with the demand for them, an important question remains: Are shortages of teachers likely to develop between now and 1995? BLS doesn't think so.

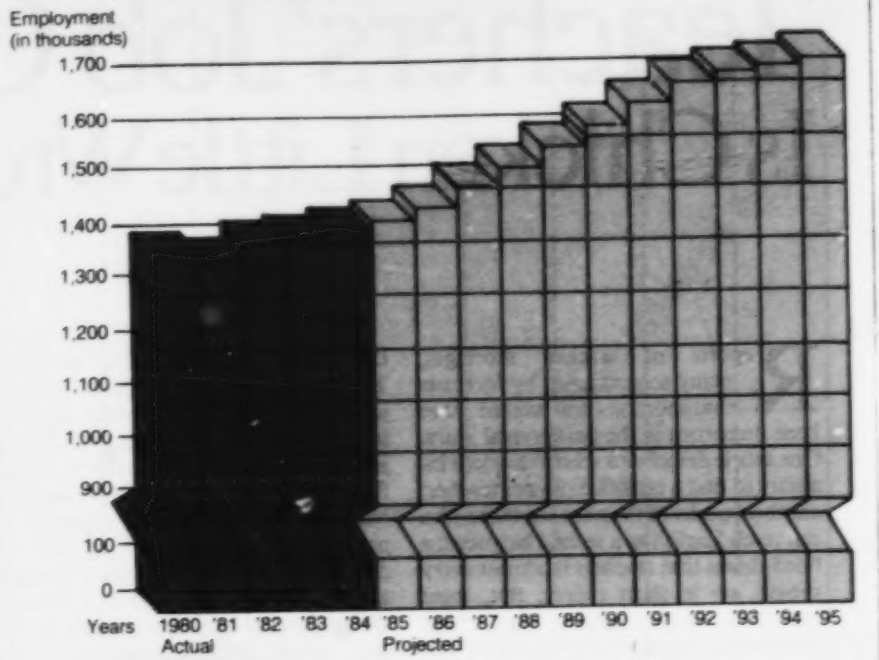
The number of job openings for teachers can be forecast with some confidence because projections of the school-age population are quite accurate, as are data on the number of teachers approaching retirement age. According to these projections, significant increases in hiring needs for elementary school teachers will occur in the short term (chart 1); hiring needs for secondary school teachers will decrease in the late 1980's and will not increase until the mid-1990's (chart 2).

Projecting the supply of teachers is much more difficult than projecting the number needed, in part because the effect of changing conditions in an occupation is difficult to predict. With regard to teaching, however, BLS believes that changes being brought on by education reform measures such as higher pay and higher status for teachers, in combination with normal market adjustments, should not only prevent shortages from materializing but may even enable schools to be more selective in hiring.

How Many Teachers Will Be Needed?

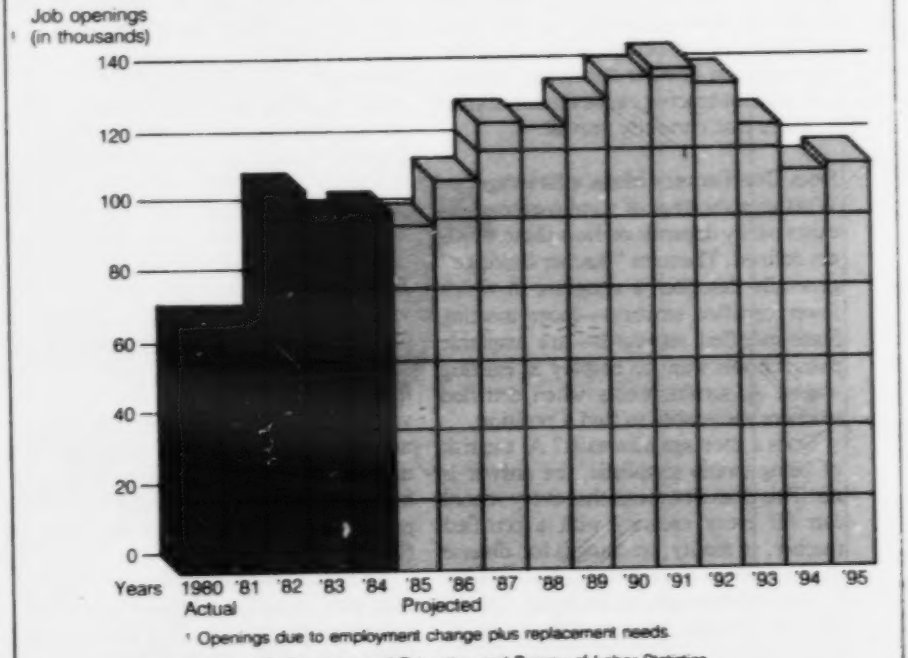
Job openings for teachers occur as schools replace teachers who leave the labor force or transfer to other occupations and as they seek to increase the number employed in response to greater

Chart 1. **Employment of elementary school teachers will grow 20 percent, 1984 to 1995.**



Source: U.S. Department of Education and Bureau of Labor Statistics.

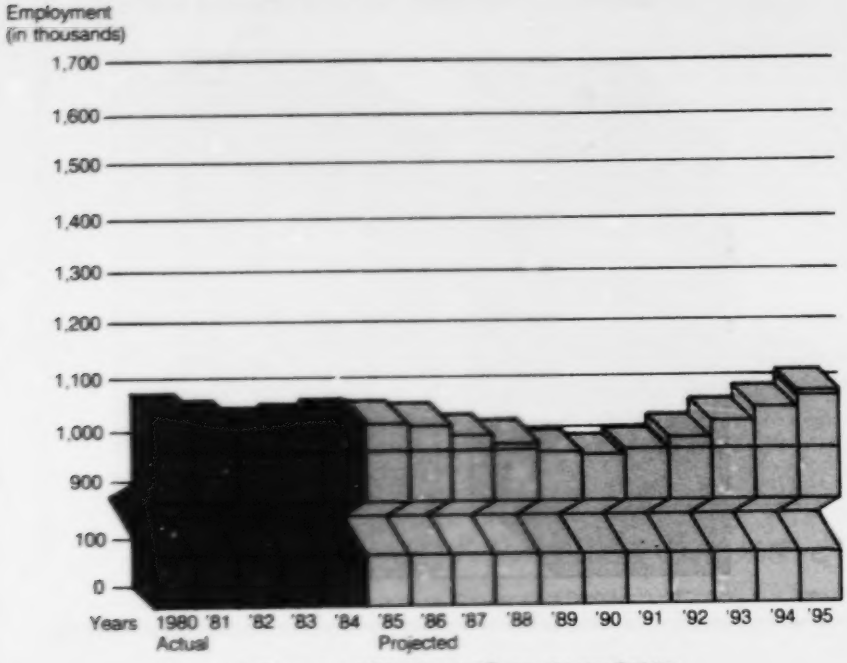
Chart 3. **Job openings[1] for elementary school teachers will peak in 1991.**



[1] Openings due to employment change plus replacement needs.

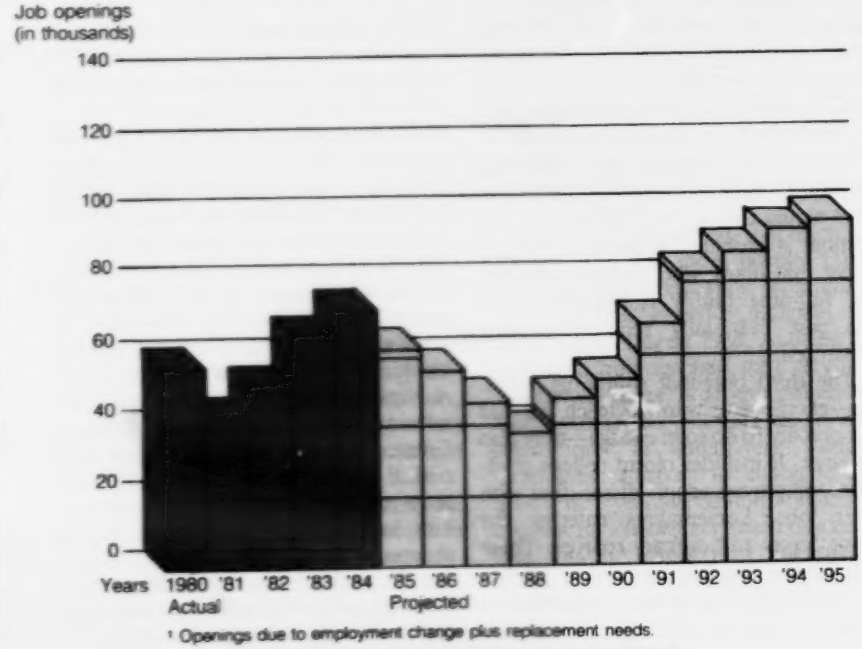
Source: U.S. Department of Education and Bureau of Labor Statistics.

Chart 2. **By 1995, employment of secondary school teachers will be slightly above the 1984 level.**



Source: U.S. Department of Education and Bureau of Labor Statistics.

Chart 4. **By 1992, job openings[1] for secondary school teachers will exceed the 1984 level.**



[1] Openings due to employment change plus replacement needs.

Source: U.S. Department of Education and Bureau of Labor Statistics.

student enrollments or to lower pupil-teacher ratios. Overall, hiring needs are projected to average about 170,000 a year from 1986 to 1989 and 210,000 a year from 1990 to 1995 for elementary and secondary teachers combined; this compares with 175,000 total hires in 1984.

Most job openings are created by occupational separations. The Department of Education estimates that 6 to 8 percent of school teachers leave the occupation annually, a rate not significantly different from that for other professional occupations, according to BLS data.

For teachers, by far the second most important cause of new openings is increased enrollment. Data on student enrollments are available separately for elementary and secondary schools. In elementary schools, enrollments are projected to increase throughout the 1984–95 period, with the fastest growth between 1988 and 1992. In secondary schools, declines are projected between the fall of 1985 and the fall of 1990, followed by a slow return to the 1984 level.

Generally, changes in the pupil-teacher ratio account for a relatively small percentage of new jobs. Modest declines in the pupil-teacher ratio are projected for both levels.

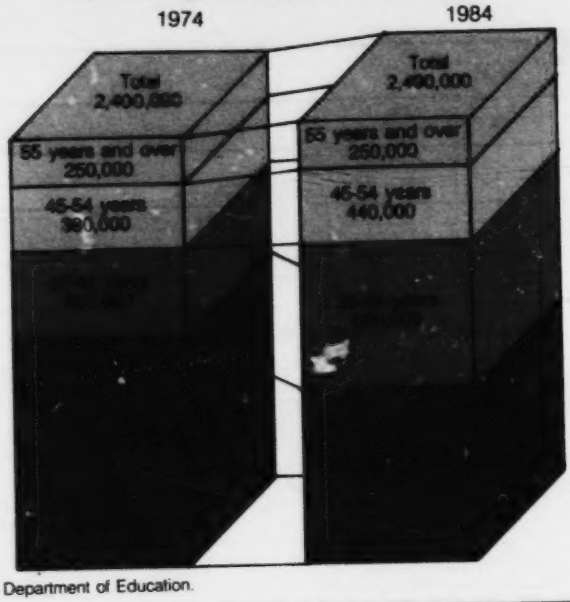
Taking all the above factors into consideration, demand for elementary school teachers will rise. At a separation rate of 6 percent and at the growth rates expected, the number of openings for elementary school teachers would increase gradually from 100,000 in 1984 to 140,000 a year between 1990 and 1992; the number of openings would decline slowly to 115,000 by 1995, because the elementary school population will grow more slowly (chart 3).

In secondary schools, all growth will be due to lower pupil-teacher ratios. However, even with lower pupil-teacher ratios and a 6-percent separation rate, hiring needs would decline from 73,000 in 1984 to 38,000 in 1988; they would then gradually rise to 97,000 by 1995 (chart 4).

Teachers

Chart 5. **The number of teachers age 45 or over has increased only slightly over the past decade.**

Teachers' age distribution, 1974 and 1984



SOURCE: U.S. Department of Education.

Will Retirements Create More Openings?
There have been some recent reports of an incipient surge in retirements due to an aging teacher work force. However, BLS data on the age of elementary and secondary teachers show no reason to expect an increase soon. Because most teachers are eligible to retire by age 55 and most do retire soon after that age, those who will retire between now and 1995 are presently 45 and older.

The present pool of teachers aged 45 and older is only slightly larger than it was in 1974 (chart 5). Therefore, the number of retirements in the next decade should be about the same as it was in the last one; no surge is likely. After 1995, however, the situation may change. In the 1983–84 academic year, the 35–44 age group was twice the size of the 45–54 group. A big increase in retirements will occur when the 35–44 age group reaches retirement age.

How Many Teachers Will Be Available?
Entrants to teaching come from three groups: Recent college graduates, former teachers who are not teaching, and people interested in teaching who have not prepared to become teachers while in college.

Recent college graduates certified to teach are a major source of entrants to teaching. The proportion of college graduates preparing to teach has dropped sharply since the late 1960's and early 1970's (chart 6). In 1966–67, almost 40 percent of the bachelor's degrees granted were given to people prepared to teach; in 1983–84, only about 12 percent were. The number of potential teachers has declined from a peak of 317,000 in 1971–72 to 120,000 in 1983–84.

At least two factors—a stick and a carrot—explain this decline. The stick was the falling demand for teachers. When the number of job openings for teachers dropped sharply, so did the proportion of students preparing to teach. The carrot is much more difficult to gauge. While job opportunities in teaching declined, the range of opportunities for women—who made up the vast majority of potential elementary school teachers—expanded, so that some of the decreased interest in teaching may be explained by improved job prospects in other fields.

Another major source of teachers is the reserve pool, which consists of two groups: Former teachers who left the profession for full-time family responsibilities or took other jobs and people who prepared to teach but did not seek or could not find teaching jobs. Although we do not know how many in this reserve pool would like to become teachers, the number is probably substantial. We do know that many who had left teaching for full-time family responsibilities in the past eventually returned to the classroom.

The third potential source of teachers—people who want to teach but did not prepare to do so in college—may also be large. It includes recent college graduates, employed people dissatisfied with their jobs, homemakers entering the labor force, and military retirees. These people can become certified by going back to college for necessary courses, and some colleges have special programs for them. Many States also have alternative programs to enable capable people to become certified while teaching. Most are for secondary teachers. Participants teach subjects they are knowledgeable in, under the close supervision of experienced educators, while taking classes in education theory outside school hours.

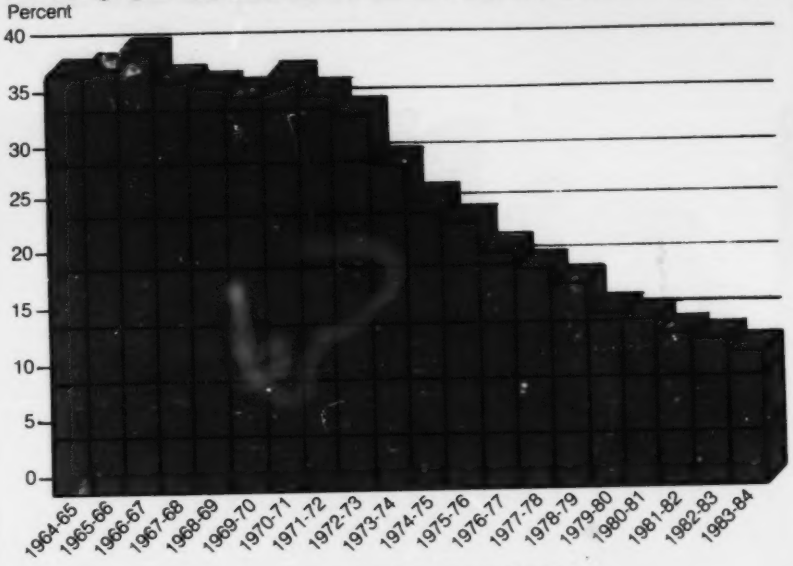
Will the Supply Increase?
Recent trends in education are likely to make teaching more attractive in the coming years.

For at least 3 years, education has been at the top of our Nation's agenda. There has been a concerted, nationwide effort by governors, State legislators, professional educators, school boards, parents, and the public as a whole to improve the quality of education in elementary and secondary schools. This education reform movement was sparked by a number of reports in 1983; the best known was *A Nation at Risk*, by the National Commission on Education Excellence. Greater recognition of education as a critical element in our Nation's ability to grow and compete in international markets has probably contributed to this movement.

As a result of this movement, curriculums are being improved and made more rigorous, and standards of academic performance and discipline for students are being raised. Teacher education pro-

Chart 6. **The proportion of college graduates preparing to teach has dropped sharply since the early 1970's.**

College graduates prepared to teach as a percent of bachelor's degrees



SOURCE: National Education Association and U.S. Department of Education.

grams in colleges are also being made more rigorous and entry requirements raised. Pay raises, more demanding certification standards, and programs to recognize outstanding teacher performance are being put in place. All these changes are likely to make teaching a more rewarding and respected profession.

Salary data provide concrete evidence that teaching is becoming more attractive. Since 1983, teacher salaries have increased faster than those in other occupations. Between 1982 and 1986, the average salary of a public school teacher rose 27.9 percent; in comparison, the average salary for accountants, attorneys, buyers, chemists, engineers, and job analysts employed in medium and large firms rose 21.9 percent. The average salary for all public school teachers in the 1985–86 academic year was $25,257. Many districts are offering $20,000 a year to start, a salary comparable to beginning offers for the majority of other college graduates.

Even without education reform, the supply of teachers could be expected to increase as more jobs become available. The traditional attractions of teaching—the opportunity to work with children and teach a favorite subject plus long summer vacations and job security—would probably pull many people to the occupation. Furthermore, the number of students and jobseekers attracted to fields generally increases as the number of openings increase even without higher salaries or other inducements. The very reports of shortages referred to at the beginning of this article are likely to attract jobseekers. College students and recent graduates should be particularly responsive to these reports because of the competition they face in other fields. A surplus of graduates over the past decade and a half has resulted in about 4 million graduates now employed in jobs not requiring a degree.

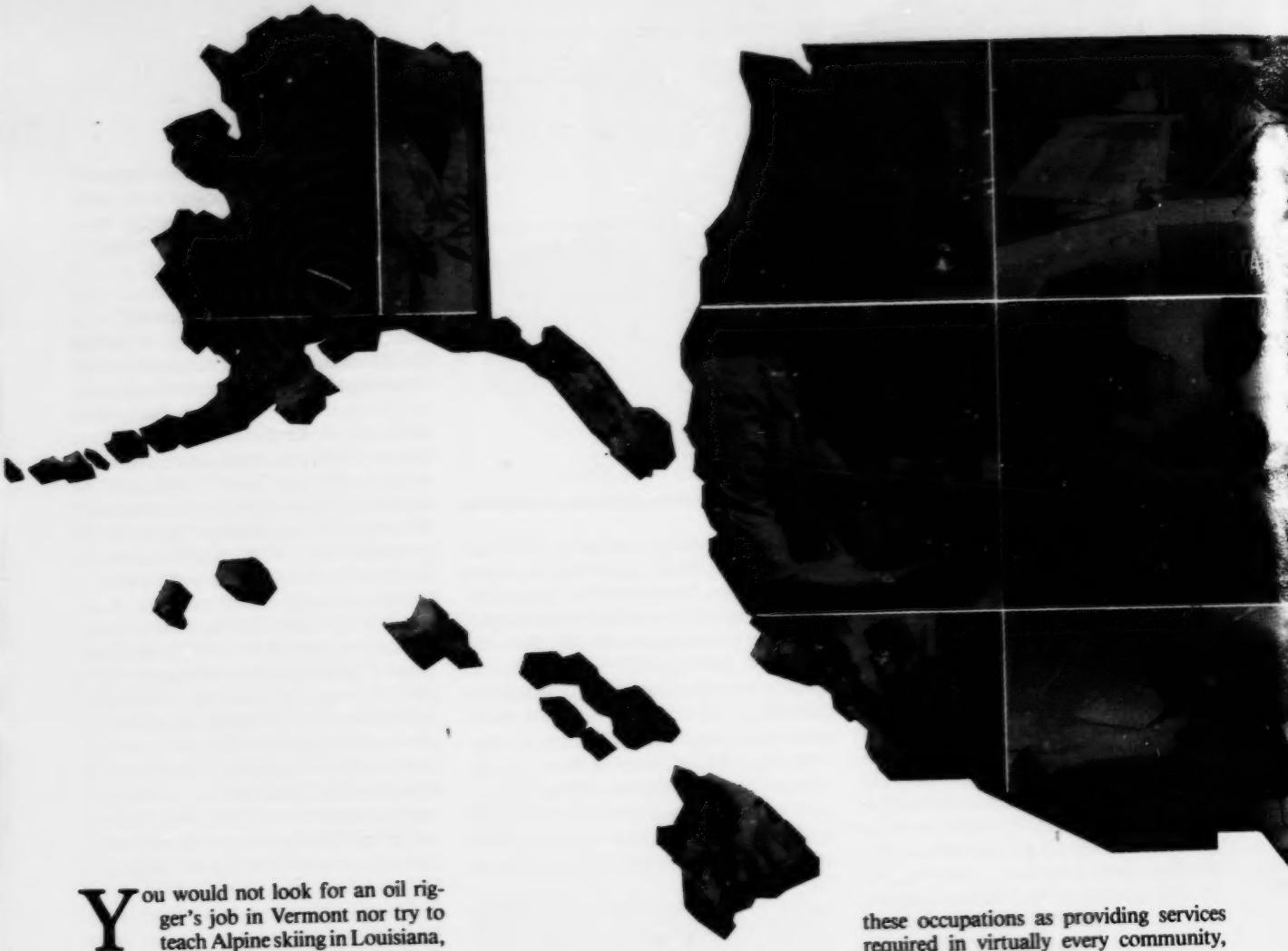
Some evidence suggests that teaching is already attracting more people: Enrollments in teacher education programs are up. The best evidence indicates they started increasing in 1984. And the time needed to train teachers isn't very long. Teacher education programs usually take 2 or 3 years, since entrants are generally sophomore- or junior-year students. Graduates returning to college usually need 1 or 2 years to complete additional courses for elementary teaching credentials, but for those who want a high school certificate and have a major in the subject they want to teach, no more than a year is needed. The number of teacher education graduates may actually be up for the class of 1986, but data are not yet available. And if conditions are improved enough to attract more college students to teaching, we should also be seeing more applicants from the teacher reserve pool and other sources.

Will the Supply Meet the Demand?

BLS projects that an average of about 35,000 more teacher job openings will occur over the 1990–95 period than actually occurred in 1984. Assuming that there were no teacher surpluses or shortages in 1984, the same number of additional applicants would obviously be needed. If all were to come from the ranks of recent graduates and if only about three-fourths of those prepared to teach actually sought teaching jobs (the historical average), the percentage of all graduates prepared to teach would need to increase from 12 to 17. This would still be well below the proportions who prepared for teaching positions in the 1960's and 1970's. If individuals are as responsive as we suspect to pay and status improvements brought about by education reform and to the reports of more openings in elementary schools, then the number of people aspiring to be teachers is likely to increase sharply. Actually, the additional openings could be filled even if the number of new education graduates is lower than the figure given because more certified teachers could be expected to enter the profession from the reserve pool and other sources.

Indications, therefore, are that no shortage of teachers will develop. This is not to say that every school will always find every teacher it wants. Regardless of the general market conditions, shortages may persist in some fields and in less attractive school districts. On the whole, however, no large-scale shortages are likely. Paradoxically, rising salaries and improved conditions brought about by the education reform movement may even enable school districts to raise their standards for teachers.

Where the Workers Are:



You would not look for an oil rigger's job in Vermont nor try to teach Alpine skiing in Louisiana, would you? These occupations are obviously connected with particular geographic regions. But would you guess that most aviation engineers live in California? Probably not. The following table—developed by the Bureau of Labor Statistics from unpublished data collected for the 1980 census—provides information on occupations that are concentrated in particular States. By looking it over, you can determine if the jobs that interest you are held by residents of the States where you want to live.

Stephen Tise and David Frank are labor economists in the Division of Occupational Outlook, BLS.

The State of Employment

As one would expect, most occupations are distributed much like the population. Just over half of all the workers live in the nine States that account for about half the population (in descending order of population): California, New York, Texas, Illinois, Pennsylvania, Ohio, Florida, Michigan, and New Jersey. Residents of these States also account for roughly half the workers in many occupations, such as dental assistant, barber, mail carrier, elementary school teacher, cashier, and secretary. An astute eye might recognize these occupations as providing services required in virtually every community, large or small.

Not all occupations match the national pattern, however. In some occupations, employment is largely concentrated in States endowed with some important natural resource. Fishers, for example, depend on water, as everyone knows; not surprisingly, they are concentrated in the coastal States of California, Florida, Louisiana, Maine, Massachusetts, Washington, and North Carolina. Neither is it a surprise to find petroleum engineers concentrated in Texas and Louisiana or to learn that Michigan, home of many American automobile manufacturers,

A State-by-State Guide to the Labor Force in 200 Occupations

by Stephen Tise and David Frank

employs more mechanical engineers than any other State.

The geographic concentration of some other occupations is more unexpected. For instance, textile employment is concentrated in North Carolina, South Carolina, and Georgia. And large numbers of mathematical and computer scientists reside in Maryland and Virginia, largely because of the Federal Government's employment of these workers in and around the District of Columbia.

The Table

The table on the following pages presents State-by-State data for 200 occupations.

The columns give the U.S. total and State of residence for workers in the occupation. Occupations are grouped by Census classifications. The States are listed in the order of their population, largest first; this arrangement enables you to determine quickly whether the number of the State's residents in an occupation is in proportion to the population. The numbers in bold face add up to at least 50 percent of the Nation's total work force in the occupation.

Employment by census occupation and State, 1980

(Numbers in thousands)

State	All occupations	Executive, administrative, and managerial occupations										Management related occupations				
		Legislators	Administrators and officials, public administration	Financial managers	Personnel and labor relations managers	Managers, marketing, advertising, and public relations	Administrators, education and related fields	Managers, medicine and health	Managers, properties and real estate	Other managers and administrators	Accountants and auditors	Underwriters	Other financial officers	Management analysts	Personnel, training, and labor relations specialists	Wholesale and retail buyers
United States	97639.4	10.5	290.5	403.5	214.7	674.4	382.6	108.5	193.9	5097.2	993.3	18.2	398.7	115.6	410.4	163.0
California	10640.4	.7	21.4	50.1	26.8	83.2	37.9	12.1	36.5	652.6	124.1	1.8	62.3	18.0	56.4	19.9
New York	7440.8	.8	20.3	39.6	18.1	56.9	32.5	8.8	19.8	389.2	93.3	2.3	34.8	10.4	32.8	18.1
Texas	6311.8	.2	15.8	23.9	15.6	47.9	24.7	6.4	20.3	316.9	69.9	1.0	27.1	6.3	24.4	11.2
Illinois	5068.4	.5	10.4	21.1	10.3	39.9	18.3	5.5	5.6	277.9	57.0	.7	19.9	6.2	23.4	9.5
Pennsylvania	4961.5	.4	13.2	19.9	9.9	33.9	18.3	5.2	4.8	211.1	44.5	1.2	15.5	4.8	17.2	7.7
Ohio	4558.4	.4	10.3	19.4	9.5	37.0	17.6	4.9	6.3	222.4	41.3	.9	14.9	3.8	14.8	7.9
Florida	4002.3	.6	9.3	14.7	7.6	26.9	14.3	4.3	10.3	265.4	39.4	.7	16.5	5.1	13.7	7.5
Michigan	3750.7	.4	9.9	15.2	8.5	25.3	15.8	3.9	5.4	162.1	36.9	.4	12.5	3.0	17.4	5.1
New Jersey	3288.3	.2	9.2	21.5	8.5	34.9	13.1	3.2	4.8	195.3	43.5	1.2	13.9	4.7	16.6	7.0
Massachusetts	2674.3	.4	8.7	13.9	6.1	21.4	13.9	4.8	3.8	137.0	29.8	1.1	10.6	4.3	11.8	5.3
North Carolina	2607.9	.1	5.2	8.7	5.4	13.7	9.3	2.6	2.0	123.5	18.8	.2	8.9	1.5	8.7	3.3
Indiana	2366.3	.1	5.0	8.3	4.5	14.1	8.4	2.1	2.7	103.5	18.6	.3	7.5	1.1	7.2	3.1
Virginia	2348.4	.5	19.9	10.4	6.2	12.1	10.6	2.8	4.3	121.2	25.6	.3	9.9	8.8	13.3	3.3
Georgia	2335.8	.1	7.4	9.3	4.8	17.2	8.8	2.2	3.8	121.9	24.1	.3	8.2	2.9	9.1	3.7
Wisconsin	2114.5	.3	5.1	6.3	3.5	12.4	7.5	2.3	2.0	99.6	17.2	.2	6.9	1.3	7.9	2.4
Missouri	2103.9	.2	5.8	6.6	4.3	12.8	7.5	2.7	3.3	102.1	19.5	.4	7.9	1.8	8.5	3.2
Maryland	1946.6	.5	19.0	9.2	5.6	11.6	9.3	2.8	4.0	105.2	23.7	.5	7.3	5.9	12.6	2.7
Tennessee	1914.9	.1	4.2	7.0	3.4	11.2	6.6	1.6	2.2	89.1	15.8	.2	6.0	1.1	7.1	2.8
Minnesota	1885.5	.3	4.4	7.0	3.9	14.9	5.9	2.1	3.0	104.2	20.8	.4	7.5	1.2	8.5	3.3
Washington	1794.4	.2	6.1	7.9	3.5	11.8	7.7	2.2	6.1	92.9	17.8	.4	8.3	2.7	7.5	3.6
Louisiana	1639.4	.1	3.9	5.9	3.6	7.5	6.5	1.6	2.5	81.6	15.4	.1	4.4	1.2	6.2	2.7
Alabama	1511.9	.1	4.6	4.7	3.5	8.0	5.9	1.7	1.9	63.8	11.8	.1	4.6	1.0	6.6	2.1
Connecticut	1482.3	.2	3.7	9.0	4.1	15.8	5.9	1.8	1.9	89.2	17.6	1.1	7.5	3.0	7.7	2.2
Kentucky	1388.0	.1	3.7	4.5	2.7	7.5	5.0	1.4	1.7	57.1	10.4	.1	4.8	.7	4.2	1.8
Colorado	1362.0	.2	3.9	6.1	3.1	10.2	5.4	1.3	4.8	87.0	17.5	.2	7.1	1.8	6.3	2.4
South Carolina	1320.0	.2	3.2	3.8	2.6	5.1	4.5	1.5	1.4	63.9	9.4	.1	3.8	1.0	4.8	1.7
Iowa	1304.6	.1	3.5	3.6	2.1	7.7	4.4	1.5	1.2	61.2	9.6	.2	4.9	.6	4.5	1.4
Oklahoma	1287.9	.1	4.5	4.1	2.6	7.8	5.9	1.4	3.8	63.2	13.6	.2	5.4	1.0	4.9	1.6
Oregon	1138.4	.1	3.6	5.2	2.3	7.6	5.0	1.2	3.2	65.0	10.4	.2	5.9	1.0	4.0	2.3
Arizona	1113.3	.1	3.4	4.0	2.3	6.9	4.2	1.4	2.9	70.8	11.6	.2	5.6	.7	5.2	1.7
Kansas	1078.7	.1	3.3	3.7	2.1	6.8	4.8	1.4	1.8	52.5	10.1	.2	4.8	.8	3.2	1.4
Mississippi	937.2	.2	3.1	3.1	1.9	3.6	4.0	.9	1.4	41.4	6.1	.1	2.9	.4	3.0	.9
Arkansas	875.7	(*)	3.0	2.3	2.0	4.3	3.6	1.0	1.1	37.1	5.3	.1	2.9	.3	2.5	1.1
Nebraska	716.6	.1	1.9	2.0	1.2	3.9	2.7	.9	.9	40.5	6.2	(*)	3.0	.4	2.7	.8
West Virginia	689.5	(*)	2.1	1.5	1.2	2.4	3.0	.7	.6	30.9	4.7	(*)	1.9	.3	2.0	1.0
Utah	585.9	(*)	2.3	2.3	1.4	4.1	2.4	.5	1.1	33.3	7.7	(*)	2.7	.5	2.6	1.0
New Mexico	508.2	.1	2.6	1.5	1.2	2.2	2.4	.6	1.3	26.0	4.2	.1	1.9	.5	2.5	.4
Maine	459.5	.2	2.2	1.7	.7	2.1	2.0	.5	.6	18.2	3.1	.1	1.3	.3	1.5	.7
New Hampshire	432.6	.1	1.6	1.7	1.0	3.3	2.1	.5	.5	22.3	3.1	.1	1.4	.6	1.4	.6
Rhode Island	426.8	.1	1.3	2.0	.8	2.8	1.9	.5	.6	20.4	3.2	.1	1.4	.3	1.4	.7
Hawaii	415.2	.1	1.7	1.7	.9	2.8	1.5	.4	1.7	24.8	5.0	.1	1.9	.4	1.8	.8
Nevada	398.6	(*)	1.5	1.6	.7	1.8	.9	.4	1.3	25.4	4.1	(*)	1.5	.2	1.4	.4
Idaho	383.7	(*)	1.8	1.2	.7	2.0	1.2	.3	.7	21.8	3.0	(*)	1.7	.2	1.6	.5
Montana	328.3	(*)	1.4	.9	.5	1.1	1.4	.3	.6	19.1	2.5	.1	1.5	.1	1.2	.4
District of Columbia	298.1	.5	5.2	.8	.8	.6	1.9	.4	1.0	14.5	3.4	(*)	1.5	2.6	2.8	.3
South Dakota	296.7	(*)	1.2	.7	.5	1.5	1.5	.5	.4	13.3	1.9	(*)	1.3	.1	.8	.3
North Dakota	272.6	(*)	1.0	.8	.3	1.4	.9	.4	.3	12.4	1.9	(*)	1.2	.1	.8	.2
Delaware	262.8	.1	.8	1.1	.6	1.9	1.0	.2	.4	12.8	2.7	(*)	.9	.3	1.4	.4
Vermont	227.2	.1	1.3	.8	.5	1.1	1.3	.3	.2	11.5	1.6	(*)	.9	.2	.8	.2
Wyoming	217.4	(*)	1.2	.5	.3	.9	.8	.3	.6	12.0	1.7	(*)	.7	.1	.7	.2
Alaska	164.9	.1	1.2	.6	.3	.5	.8	.2	.6	11.7	2.7	(*)	.8	.1	1.0	.1

(*) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Executive, administrative, and managerial occupations—Continued: Management related occupations—Continued: Purchasing agents	Business and promotion agents	Construction inspectors	Inspectors and compliance officers, except construction	Architects	Engineers, architects, and surveyors: Engineers, total	Engineers: Aerospace engineers	Metallurgical and materials engineers	Mining engineers	Petroleum engineers	Chemical engineers	Nuclear engineers	Civil engineers	Electrical and electronic engineers	Industrial engineers	Mechanical engineers
United States	187.1	19.7	48.5	152.3	105.1	1382.1	87.8	24.2	9.8	22.8	56.9	9.2	200.5	319.8	191.0	195.0
California	**24.7**	**3.7**	**6.3**	**15.2**	**17.3**	**213.2**	**33.8**	**1.9**	**.5**	**1.9**	**3.7**	**1.7**	**30.2**	**57.7**	**24.8**	**20.8**
New York	**13.9**	**2.6**	**3.4**	**11.8**	**8.3**	**93.6**	3.6	**1.4**	.1	.1	**3.1**	**.6**	**12.6**	**24.9**	**13.4**	**14.0**
Texas	**13.7**	**.8**	**3.2**	**10.5**	**7.7**	**96.0**	**6.2**	**1.0**	**.6**	**9.2**	**7.5**	**.2**	**14.4**	**20.8**	**10.3**	9.2
Illinois	**10.2**	**.8**	1.5	**6.2**	**5.4**	**68.7**	.7	1.4	.3	.3	**2.8**	.3	**9.5**	**16.0**	**10.8**	**12.8**
Pennsylvania	**9.6**	**.7**	**2.4**	**7.7**	**4.2**	**68.0**	**1.1**	**3.0**	**.8**	**.2**	**3.4**	**.7**	**8.4**	**13.9**	**12.2**	**10.8**
Ohio	**9.8**	**.7**	**2.1**	**5.6**	**3.4**	**69.6**	3.6	**2.9**	.3	.1	**4.2**	.2	**7.3**	12.4	**12.1**	**13.6**
Florida	**6.8**	**.9**	**2.3**	**7.4**	**5.2**	**43.9**	**4.3**	.4	.3	.1	**1.0**	.2	**6.8**	**13.5**	**3.8**	**4.1**
Michigan	**7.7**	.5	**1.7**	**4.2**	**3.0**	**63.9**	.5	**1.8**	.1	.1	**2.1**	.2	**5.5**	**7.8**	**9.8**	**26.3**
New Jersey	**7.2**	**.6**	**1.6**	**6.7**	**2.9**	**55.8**	**.8**	.7	(*)	**.2**	**5.0**	**.3**	**7.0**	**15.2**	**5.9**	**7.5**
Massachusetts	**6.0**	**.6**	**1.4**	**4.0**	**3.7**	**51.5**	**1.8**	.6	(*)	(*)	**1.3**	.2	**7.0**	**14.4**	**7.5**	**8.0**
North Carolina	**4.0**	**.4**	**1.2**	**3.2**	**1.9**	**22.3**	.2	.1	(*)	(*)	.9	.2	**3.2**	**5.5**	**4.8**	**3.2**
Indiana	**4.4**	**.3**	**.6**	**2.5**	**1.3**	**29.9**	**.6**	**1.3**	.1	.1	**1.1**	(*)	**3.1**	**6.9**	**6.3**	**6.1**
Virginia	**3.5**	**.4**	**1.7**	**5.1**	**2.8**	**33.2**	**1.0**	.4	.3	.1	**1.6**	**.5**	**6.3**	**7.7**	**3.0**	**3.0**
Georgia	**3.5**	**.4**	**.8**	**3.9**	**2.2**	**21.5**	**1.6**	.3	.1	(*)	.5	.1	**4.3**	**5.1**	**3.1**	**2.2**
Wisconsin	**4.2**	**.3**	**.8**	**2.2**	**1.5**	**22.1**	.1	.5	(*)	(*)	.5	(*)	**2.4**	**3.9**	**5.3**	**4.6**
Missouri	**3.7**	**.3**	**1.0**	**3.1**	**1.9**	**25.9**	**3.5**	.4	.1	(*)	**1.1**	.1	**3.9**	**5.8**	**3.8**	**2.9**
Maryland	**3.5**	**.5**	**1.4**	**4.8**	**2.2**	**35.5**	**1.1**	.4	.1	(*)	.8	.3	**6.1**	**11.0**	**2.8**	**3.2**
Tennessee	**3.1**	**.7**	**.8**	**2.5**	**1.5**	**21.4**	**.3**	.4	.2	(*)	**1.4**	.5	**3.1**	**5.0**	**3.4**	**2.9**
Minnesota	**3.6**	**.4**	**.8**	**2.6**	**2.0**	**22.5**	.2	.3	.2	(*)	.6	(*)	**2.9**	**5.6**	**4.5**	**3.6**
Washington	**4.0**	**.4**	**1.2**	**3.3**	**3.1**	**39.2**	**9.3**	.5	.1	.1	**1.0**	.6	**5.8**	**6.6**	**5.0**	**3.7**
Louisiana	**3.1**	**.3**	**.9**	**2.6**	**1.5**	**20.9**	.4	.2	.1	**3.7**	**2.5**	(*)	**4.4**	**2.7**	**1.5**	**1.4**
Alabama	**2.3**	**.2**	**.8**	**2.6**	**1.1**	**17.7**	**1.0**	.4	.2	.1	.9	.1	**3.6**	**3.8**	**2.0**	**1.7**
Connecticut	**3.7**	**.3**	**.7**	**1.9**	**1.8**	**31.8**	**4.0**	.9	.1	(*)	**1.0**	.5	**2.5**	**6.5**	**5.7**	**4.8**
Kentucky	**2.0**	**.2**	**.6**	**2.4**	**.8**	**13.3**	.1	.3	.5	.1	.7	(*)	**2.5**	**2.5**	**2.4**	**2.0**
Colorado	**2.6**	**.3**	**.8**	**2.1**	**2.7**	**24.8**	**1.8**	.4	**1.2**	**1.0**	.5	.1	**4.5**	**5.4**	**2.8**	**2.5**
South Carolina	**1.7**	**.2**	**.6**	**1.9**	**1.1**	**12.5**	.1	.1	(*)	(*)	**1.1**	.4	**2.0**	**2.0**	**2.4**	**1.7**
Iowa	**1.8**	**.1**	**.6**	**1.6**	**.8**	**11.7**	(*)	.1	(*)	(*)	.3	(*)	**1.9**	**2.3**	**2.5**	**2.1**
Oklahoma	**2.7**	**.1**	**.5**	**2.1**	**.9**	**14.6**	**.6**	.1	.1	**2.6**	.8	(*)	**1.8**	**2.5**	**2.1**	**1.8**
Oregon	**2.2**	**.1**	**.5**	**1.8**	**1.7**	**12.6**	.1	.2	(*)	(*)	.2	(*)	**3.1**	**3.5**	**1.3**	**1.8**
Arizona	**2.1**	**.1**	**.9**	**2.1**	**1.7**	**17.2**	**1.4**	.4	.6	(*)	.2	.1	**2.7**	**5.9**	**2.0**	**1.6**
Kansas	**1.8**	**.1**	**.5**	**1.9**	**1.2**	**13.4**	**2.2**	.1	(*)	.4	.3	(*)	**2.4**	**2.1**	**2.0**	**1.5**
Mississippi	**1.4**	**.1**	**.5**	**1.3**	**.5**	**8.1**	**.2**	.1	(*)	.3	.2	(*)	**1.8**	**1.5**	**1.3**	**.8**
Arkansas	**1.4**	(*)	**.4**	**1.7**	**.5**	**6.1**	.1	.1	(*)	.1	.3	.1	**1.2**	**1.2**	**1.2**	**.8**
Nebraska	**.9**	**.1**	**.2**	**1.0**	**.6**	**4.8**	(*)	(*)	(*)	(*)	.1	(*)	**1.2**	**1.4**	**.7**	**.5**
West Virginia	**1.0**	(*)	**.4**	**1.9**	**.2**	**7.2**	(*)	.2	**.8**	.1	**1.5**	(*)	**1.3**	**1.2**	**.7**	**.4**
Utah	**1.2**	**.1**	**.3**	**1.3**	**.7**	**8.4**	**.9**	.3	.4	.2	.3	(*)	**1.3**	**1.8**	**1.1**	**.9**
New Mexico	**.9**	**.1**	**.4**	**.9**	**.7**	**8.0**	.1	.2	.4	.4	.1	.2	**1.4**	**2.2**	**.5**	**.6**
Maine	**.8**	(*)	**.2**	**.7**	**.3**	**4.3**	(*)	.1	(*)	(*)	.2	.1	**.9**	**.7**	**.7**	**.5**
New Hampshire	**.8**	**.1**	**.2**	**.5**	**.3**	**8.6**	.2	.1	(*)	(*)	.2	.1	**1.0**	**2.6**	**1.6**	**1.4**
Rhode Island	**.7**	**.1**	**.3**	**.6**	**.3**	**4.8**	.1	.1	(*)	(*)	.1	(*)	**.5**	**1.2**	**.9**	**.9**
Hawaii	**.5**	**.2**	**.4**	**1.1**	**.9**	**4.0**	(*)	(*)	(*)	(*)	(*)	.1	**1.4**	**.9**	**.3**	**.3**
Nevada	**.6**	**.1**	**.5**	**.6**	**.4**	**3.2**	.1	.1	.1	(*)	(*)	(*)	**.9**	**.9**	**.3**	**.2**
Idaho	**.7**	**.1**	**.2**	**.8**	**.5**	**4.8**	(*)	.1	.1	(*)	.1	.5	**1.1**	**.9**	**.5**	**.5**
Montana	**.4**	(*)	**.1**	**.7**	**.4**	**2.5**	(*)	.1	.2	.1	(*)	(*)	**.9**	**.5**	**.1**	**.2**
District of Columbia	**.4**	**.2**	**.2**	**.8**	**1.0**	**1.7**	(*)	(*)	(*)	(*)	.1	(*)	**.4**	**.4**	**.1**	**.1**
South Dakota	**.3**	(*)	**.1**	**.5**	**.1**	**1.5**	(*)	(*)	(*)	(*)	(*)	(*)	**.6**	**.3**	**.1**	**.1**
North Dakota	**.2**	(*)	**.1**	**.4**	**.2**	**1.6**	(*)	(*)	(*)	.1	(*)	(*)	**.5**	**.4**	**.1**	**.1**
Delaware	**.4**	**.1**	**.1**	**.6**	**.2**	**5.0**	**.1**	.1	(*)	(*)	**1.4**	(*)	**.7**	**.6**	**.5**	**.5**
Vermont	**.4**	(*)	**.1**	**.4**	**.3**	**3.8**	.1	(*)	(*)	(*)	(*)	(*)	**.4**	**1.5**	**.6**	**.6**
Wyoming	**.4**	**.1**	**.1**	**.4**	**.2**	**2.9**	(*)	(*)	(*)	.5	.5	.1	(*)	**.9**	**.3**	**.1**	**.1**
Alaska	**.5**	(*)	**.1**	**.4**	**.3**	**2.3**	(*)	(*)	(*)	(*)	.3	(*)	(*)	**.9**	**.4**	**.1**	**.1**

(*) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Engineers, architects, and surveyors—Continued: Surveyors and mapping scientists	Mathematical and computer scientists: Computer systems analysts and scientists	Mathematical and computer scientists: Operations and systems researchers and analysts	Mathematical and computer scientists: Actuaries	Mathematical and computer scientists: Statisticians	Natural scientists: Mathematicians	Natural scientists: Physicists and astronomers	Natural scientists: Chemists, except biochemists	Natural scientists: Atmospheric and space scientists	Natural scientists: Geologists and geodesists	Natural scientists: Agricultural and food scientists	Natural scientists: Biological and life scientists	Natural scientists: Forestry and conservation scientists	Natural scientists: Medical scientists	Health diagnosing occupations: Physicians	Health diagnosing occupations: Dentists
United States	29.7	200.7	79.9	10.2	29.4	6.3	22.3	100.5	8.2	45.3	23.8	45.1	33.9	19.7	431.4	124.8
California	2.8	29.4	9.1	.7	3.5	1.3	4.7	10.2	1.1	4.1	2.6	5.9	3.3	2.1	55.3	15.2
New York	1.1	19.6	7.9	1.7	3.0	.2	1.7	7.9	.3	.5	1.1	3.3	.9	1.8	47.3	13.0
Texas	1.9	11.0	3.9	.5	1.2	.2	.6	6.3	.5	11.9	1.3	1.8	1.7	.8	22.9	6.1
Illinois	1.0	10.8	3.7	.8	1.5	.1	1.0	6.3	.4	.5	.9	1.8	.6	.9	22.8	6.1
Pennsylvania	.9	9.5	4.1	.6	1.2	.1	.8	6.3	.3	.8	.7	1.9	1.0	1.0	23.6	7.1
Ohio	.9	8.0	3.2	.3	.9	.2	.7	6.1	.2	.5	.9	1.3	.7	.8	18.2	5.3
Florida	1.7	5.5	2.2	.1	.7	.2	.5	2.3	.4	.6	1.3	1.5	1.2	.5	19.3	5.2
Michigan	.8	7.5	3.0	.2	1.1	(*)	.3	4.2	.2	.4	.6	1.4	.8	.8	16.8	5.4
New Jersey	.8	10.0	5.0	1.0	1.3	.4	1.3	8.7	.2	.3	.6	2.1	.3	1.0	16.8	4.9
Massachusetts	.6	8.7	3.0	.5	.9	.2	1.3	3.2	.3	.4	.6	2.0	.4	.8	15.0	3.9
North Carolina	1.1	2.3	1.2	(*)	.6	(*)	.2	2.3	.2	.2	.5	.9	1.0	.4	8.9	2.3
Indiana	.4	2.8	1.3	.2	.4	(*)	.2	2.6	.1	.3	.5	.9	.4	.6	7.1	2.3
Virginia	.9	9.8	6.4	.2	1.5	.6	1.0	2.2	.2	.9	.7	1.1	.9	.5	10.0	2.5
Georgia	.8	3.5	1.6	.2	.6	.1	.1	1.7	.2	.3	.6	.8	1.3	.5	8.0	2.5
Wisconsin	.6	3.0	1.0	.2	.4	(*)	.2	1.3	.2	.2	.6	1.0	.6	.4	7.4	3.1
Missouri	.4	3.5	1.2	.1	.4	.1	.2	2.0	.2	.3	.4	.9	.6	.4	8.4	2.1
Maryland	.5	9.5	4.4	.2	3.1	1.2	1.8	2.9	.4	.8	.9	2.5	.3	1.0	12.1	2.7
Tennessee	.6	1.9	1.1	.1	.4	.1	.4	2.2	.1	.4	.3	.7	.7	.4	7.4	2.2
Minnesota	.7	4.4	1.0	.2	.4	(*)	.2	1.6	.1	.3	.6	.8	.6	.4	7.5	2.6
Washington	.7	5.8	1.8	.1	.5	.1	.5	1.2	.1	.9	.6	1.3	1.6	.4	7.2	2.9
Louisiana	.6	1.1	.4	(*)	.3	.1	.1	1.5	.1	3.1	.5	.5	.7	.2	6.5	2.0
Alabama	.7	1.8	.7	(*)	.3	.1	.4	1.1	.1	.2	.5	.5	1.1	.2	5.1	1.4
Connecticut	.4	5.1	2.6	.9	.6	.1	.4	1.7	.1	.2	.3	.7	.2	.4	7.5	2.6
Kentucky	.5	1.0	.6	.1	.2	(*)	(*)	1.0	.1	.3	.2	.3	.4	.2	4.9	1.3
Colorado	1.0	3.7	.8	.1	.5	.1	.4	1.4	.3	5.6	.5	.9	.6	.3	6.0	1.8
South Carolina	.4	1.0	.7	(*)	.1	(*)	.3	1.2	.1	.2	.4	.3	.7	.2	3.9	1.3
Iowa	.4	1.5	.6	.1	.3	(*)	.1	.5	.1	.2	.4	.4	.4	.2	3.9	1.4
Oklahoma	.4	2.4	.7	(*)	.2	(*)	.1	1.1	.1	2.6	.2	.3	.4	.1	4.4	1.2
Oregon	.7	1.5	.5	(*)	.3	(*)	.1	.4	.1	.4	.5	.8	2.3	.3	4.9	2.0
Arizona	.6	2.6	.8	.1	.3	.1	.2	.7	.2	.8	.5	.6	.6	.2	5.4	1.3
Kansas	.3	1.5	.4	.1	.2	.1	(*)	.7	.1	.6	.4	.3	.3	.2	4.3	1.3
Mississippi	.3	.5	.3	(*)	.1	(*)	.1	.6	.1	.8	.3	.4	.9	.1	2.7	.8
Arkansas	.4	.4	.1	(*)	.1	(*)	(*)	.5	(*)	.1	.2	.3	.6	.1	2.8	.7
Nebraska	.2	1.1	.3	.2	.1	(*)	(*)	.4	.1	.1	.3	.2	.2	.1	2.4	.9
West Virginia	.2	.3	.3	(*)	.1	(*)	(*)	.9	(*)	.3	.1	.2	.4	.1	2.8	.7
Utah	.3	1.1	.3	(*)	.2	(*)	.1	.6	.1	.7	.1	.4	.5	.2	2.5	.9
New Mexico	.4	1.2	.3	(*)	.1	.1	1.3	.6	.1	.8	.2	.4	.6	.1	2.4	.5
Maine	.2	.4	.2	(*)	(*)	(*)	(*)	.2	.1	.1	.1	.3	.3	.1	1.9	.4
New Hampshire	.2	1.3	.3	(*)	.1	(*)	.1	.3	.1	.1	.1	.3	.2	.1	1.4	.4
Rhode Island	.1	.7	.2	.1	.1	(*)	(*)	.4	(*)	.1	(*)	.3	(*)	.1	1.8	.5
Hawaii	.2	.6	.2	(*)	.2	(*)	.1	.2	.1	.1	.2	.3	.1	.1	1.6	.6
Nevada	.2	.4	.1	(*)	.1	(*)	.1	.3	(*)	.6	.1	.2	.3	.1	1.1	.4
Idaho	.2	.3	.2	(*)	.1	(*)	.2	.3	(*)	.4	.3	.3	.9	.1	1.1	.6
Montana	.3	.1	.1	(*)	(*)	(*)	(*)	.1	.1	.3	.2	.4	.8	.1	1.1	.6
District of Columbia	(*)	1.1	1.4	(*)	.8	(*)	.1	.3	.1	.1	.1	.4	(*)	.1	1.8	.3
South Dakota	.1	.1	(*)	(*)	(*)	(*)	(*)	.1	(*)	.1	.2	.1	.2	(*)	.7	.3
North Dakota	.2	.1	(*)	(*)	(*)	(*)	(*)	.2	.1	.1	.2	.1	.1	.1	1.0	.2
Delaware	.1	.5	.3	(*)	.1	(*)	(*)	1.2	(*)	(*)	.1	.2	.1	.1	1.1	.2
Vermont	.1	.3	.2	(*)	(*)	(*)	(*)	.1	(*)	(*)	.1	.1	.2	(*)	1.1	.3
Wyoming	.4	.1	(*)	(*)	(*)	(*)	(*)	.2	.1	1.0	.1	.2	.2	(*)	.5	.2
Alaska	.3	.2	.1	(*)	.1	(*)	(*)	.1	.1	.5	.1	.6	.3	(*)	.6	.2

(*) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Health diagnosing occupations—Continued			Health assessment and treating occupations				Therapists				Teachers, except postsecondary				
	Veterinarians	Optometrists	Podiatrists	Registered nurses	Pharmacists	Dietitians	Respiratory therapists	Occupational therapists	Physical therapists	Speech therapists	Physicians' assistants	Teachers, postsecondary	Teachers, prekindergarten and kindergarten	Teachers, elementary	Teachers, secondary school	Counselors
United States	34.1	24.4	7.7	1266.8	143.5	65.2	47.6	17.5	42.5	40.9	29.7	625.8	176.9	2285.2	849.7	193.5
California	3.7	3.1	1.0	129.3	13.2	6.1	5.9	1.9	5.9	4.4	3.3	69.5	20.7	211.7	71.2	21.2
New York	1.7	1.8	1.0	118.7	10.9	5.9	2.5	2.0	3.7	3.8	1.9	53.8	12.3	176.1	73.1	16.6
Texas	2.2	1.0	.2	59.2	8.0	3.5	3.7	.9	2.3	2.2	1.7	36.0	15.5	152.1	48.2	11.3
Illinois	1.5	1.7	.5	72.3	9.1	3.6	2.5	.9	2.0	2.2	1.7	32.1	7.0	109.5	43.9	8.1
Pennsylvania	1.4	1.4	.7	81.2	7.5	3.2	2.2	1.0	2.3	2.6	1.4	30.1	7.3	114.8	40.8	10.4
Ohio	1.4	1.2	.5	62.9	6.9	3.5	2.7	.7	1.7	2.1	1.4	25.6	8.5	101.8	40.6	7.9
Florida	1.6	.9	.4	53.7	6.0	2.0	2.4	.5	1.8	1.3	2.5	18.3	6.6	85.0	32.5	7.9
Michigan	1.2	.9	.3	46.9	6.0	2.3	2.4	1.0	1.5	1.4	1.2	23.7	5.2	91.7	33.0	7.9
New Jersey	.7	.7	.5	47.7	5.0	2.2	1.0	.5	1.3	1.7	.7	14.8	5.3	88.1	33.5	6.6
Massachusetts	.6	.8	.4	49.6	4.2	2.3	1.5	1.0	2.0	1.5	.4	24.8	5.4	65.4	29.6	7.2
North Carolina	.6	.5	.1	26.8	3.6	2.0	.9	.2	1.0	.7	.7	19.5	5.3	60.8	23.7	5.1
Indiana	.9	.8	.1	28.1	3.3	1.5	1.5	.4	.7	.9	.5	15.4	4.0	55.2	17.5	4.0
Virginia	.9	.4	.1	28.6	3.0	1.3	.8	.3	.8	.8	.6	15.5	4.3	59.4	20.9	4.7
Georgia	.7	.3	.1	24.8	3.8	1.7	1.1	.2	.7	.6	.6	10.6	5.0	61.9	17.1	3.5
Wisconsin	1.0	.6	.2	27.4	2.8	1.3	.8	.8	1.1	.8	.4	15.5	2.6	50.7	18.6	4.5
Missouri	.9	.6	.1	26.3	3.3	1.4	1.3	.4	.9	.9	.9	12.5	3.9	49.3	18.4	3.6
Maryland	.7	.4	.2	28.6	2.6	1.6	.8	.3	.9	.8	.9	12.1	3.4	47.5	16.8	4.5
Tennessee	.6	.4	(1)	21.3	3.2	1.5	1.1	.1	.7	.7	.6	11.2	3.5	51.4	9.8	2.8
Minnesota	.8	.4	.1	29.5	2.6	1.2	.6	.7	1.0	.7	.4	11.7	2.3	42.5	22.9	3.6
Washington	.8	.5	.1	22.5	2.7	.8	.7	.5	.9	.6	.6	12.6	3.9	36.2	12.2	4.0
Louisiana	.5	.3	.1	15.0	3.0	1.5	.9	.2	.4	.8	.6	10.0	3.1	50.8	11.4	2.5
Alabama	.6	.2	(1)	16.1	2.8	1.2	.8	.1	.5	.5	.7	9.4	4.1	40.1	10.3	2.4
Connecticut	.3	.3	.1	23.3	1.9	.9	.7	.2	1.0	.7	.3	8.9	3.0	32.7	17.9	3.4
Kentucky	.6	.3	(1)	14.8	2.1	1.0	.8	.1	.3	.4	.3	8.9	2.0	36.5	9.1	2.9
Colorado	.7	.3	(1)	17.9	1.9	.7	.6	.4	.8	.6	.5	9.6	2.5	28.5	12.2	3.1
South Carolina	.3	.2	(1)	14.1	2.2	1.0	.5	.1	.4	.5	.5	7.1	2.1	34.7	11.1	2.4
Iowa	1.2	.5	.1	18.3	2.0	1.1	.6	.2	.5	.6	.3	10.2	2.0	30.2	14.4	2.8
Oklahoma	.5	.4	(1)	12.2	2.1	.9	.6	.1	.6	.6	.3	8.7	2.9	29.2	10.7	2.6
Oregon	.6	.3	.1	14.5	1.8	.5	.5	.2	.5	.5	.3	9.2	2.2	25.5	9.7	2.5
Arizona	.4	.4	.1	14.9	1.9	.8	.6	.2	.5	.3	.6	7.9	2.2	26.2	12.5	2.6
Kansas	.6	.4	.1	14.2	1.3	.7	.5	.2	.5	.4	.3	8.8	2.3	24.3	10.2	2.0
Mississippi	.3	.2	(1)	8.7	1.5	.8	.4	(1)	.2	.3	.1	6.3	3.3	25.1	11.0	1.9
Arkansas	.4	.2	(1)	7.7	1.4	.6	.5	.1	.2	.5	.1	4.6	1.7	19.9	8.7	1.3
Nebraska	.4	.2	(1)	10.3	1.1	.6	.3	.1	.2	.3	.2	4.7	1.0	16.5	8.3	1.3
West Virginia	.2	.2	(1)	8.5	.9	.5	.3	(1)	.2	.4	.3	3.9	.7	18.8	8.1	1.1
Utah	.2	.1	.1	6.0	.9	.3	.3	.1	.2	.2	.2	5.8	1.1	14.6	4.9	1.5
New Mexico	.2	.2	(1)	5.4	1.0	.3	.2	(1)	.2	.2	.3	4.4	.8	14.2	5.2	1.6
Maine	.2	.2	(1)	7.1	.4	.3	.3	.1	.3	.3	.1	2.7	1.0	11.8	5.5	1.0
New Hampshire	.1	.1	(1)	6.9	.5	.2	.2	.2	.2	.2	.1	2.9	.9	9.4	5.0	1.1
Rhode Island	.1	.1	(1)	6.6	.7	.3	.2	.1	.2	.2	.1	3.3	.6	9.0	4.0	.9
Hawaii	.1	.1	(1)	4.4	.4	.1	.1	.1	.1	.1	.3	3.2	.9	9.3	3.4	1.1
Nevada	.2	(1)	(1)	4.0	.6	.2	.2	.1	.1	.1	.3	1.5	.4	6.9	2.7	.6
Idaho	.3	.1	(1)	3.8	.5	.3	.2	(1)	.1	.2	.1	2.5	.5	9.6	3.1	.6
Montana	.2	.2	(1)	4.1	.4	.3	.1	.1	.1	.2	.1	2.2	.5	9.4	4.1	.6
District of Columbia	(1)	(1)	(1)	2.8	.3	.3	.1	.1	.1	.2	.1	2.5	.5	5.8	1.3	1.2
South Dakota	.2	.1	(1)	4.1	.5	.3	.2	(1)	.1	.2	.1	2.0	.5	7.3	3.9	.6
North Dakota	.1	.1	(1)	3.8	.6	.3	.1	.1	.1	.1	(1)	2.4	.2	7.5	2.9	.5
Delaware	.1	(1)	(1)	4.4	.3	.1	.1	.1	.1	.1	.1	1.9	.5	5.1	3.9	.7
Vermont	.1	.1	(1)	3.5	.3	.2	(1)	(1)	.2	.2	(1)	2.2	.5	5.3	3.9	.7
Wyoming	.1	(1)	(1)	1.9	.3	.1	(1)	(1)	.1	(1)	.1	1.6	.5	4.0	4.0	.5
Alaska	.1	(1)	(1)	1.9	.2	.1	(1)	(1)	.1	(1)	.1	.9	.4	6.0	1.8	.4

(1) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Librarians, archivists, and curators		Social scientists and urban planners			Social, recreation, and religious workers				Writers, artists, entertainers, and athletes					
	Librarians	Archivists and curators	Economists	Psychologists	Urban planners	Social workers	Recreation workers	Clergy	Lawyers	Authors	Technical writers	Designers	Musicians and composers	Actors and directors	Painters, sculptors, craft-artists, and artist printmakers	Photographers
United States	183.4	14.9	93.5	90.9	13.0	443.0	33.8	281.0	497.2	44.0	48.1	325.3	128.8	56.7	146.1	90.4
California	16.2	1.5	11.4	13.2	2.3	50.6	4.5	21.3	63.4	10.7	7.6	45.9	20.0	15.7	23.3	12.3
New York	15.8	1.8	10.4	12.7	.9	50.9	2.7	14.9	61.3	9.0	5.5	41.4	14.7	12.1	19.9	9.9
Texas	9.6	.7	5.0	3.6	.5	19.5	1.6	20.1	27.4	1.5	2.6	20.0	7.5	2.3	8.2	5.4
Illinois	9.3	.5	5.8	4.7	.6	21.5	2.2	13.2	28.8	1.6	2.3	16.7	5.1	2.0	7.1	4.7
Pennsylvania	8.4	.7	3.6	4.4	.4	23.8	1.6	15.2	21.1	1.2	1.8	14.3	5.4	1.4	6.0	3.6
Ohio	8.3	.6	3.8	3.9	.5	20.6	1.6	12.7	19.0	.8	1.5	13.4	5.1	1.2	5.1	4.1
Florida	5.3	.4	2.6	2.7	.4	15.0	1.2	11.0	20.4	1.3	1.4	13.7	7.1	2.0	5.7	3.9
Michigan	6.7	.4	2.8	3.5	.5	20.8	1.0	10.0	16.2	.7	1.5	14.2	4.3	1.1	4.5	3.2
New Jersey	6.2	.4	5.1	3.1	.5	17.4	.9	6.7	18.7	1.3	1.9	13.2	4.1	1.5	5.3	3.0
Massachusetts	7.3	.9	3.8	4.5	.6	17.1	1.4	4.7	16.3	1.5	2.4	9.8	3.9	1.2	4.6	2.7
North Carolina	4.4	.2	1.2	1.6	.3	9.0	.3	10.5	6.6	.5	1.1	7.2	2.5	.7	1.9	1.9
Indiana	4.6	.2	1.3	1.3	.2	7.2	.8	8.3	7.4	.3	.7	6.1	2.1	.6	2.1	1.5
Virginia	5.9	.7	5.7	2.0	.4	9.3	.7	7.3	17.3	1.3	1.4	7.3	2.5	1.2	3.8	2.1
Georgia	3.8	.2	1.6	1.3	.3	10.1	.6	8.3	10.1	.6	.6	6.5	2.6	.8	2.4	1.6
Wisconsin	4.3	.4	1.4	1.8	.2	8.6	.8	6.3	8.0	.6	.7	5.8	2.3	.5	2.6	1.6
Missouri	3.7	.5	1.4	1.4	.2	9.0	.6	7.9	8.0	.6	.8	5.5	2.3	.7	2.9	1.9
Maryland	5.5	.6	4.6	2.0	.4	10.6	1.1	4.4	15.2	.8	2.7	5.5	2.4	1.0	3.5	2.0
Tennessee	3.4	.2	.8	1.1	.1	6.5	.4	7.6	6.7	.3	.4	4.7	3.5	.5	2.1	1.7
Minnesota	3.3	.3	1.9	1.5	.3	9.3	1.0	6.1	8.5	.6	1.2	5.9	2.6	.7	2.9	1.7
Washington	3.3	.2	1.5	1.9	.3	8.9	.9	5.6	8.6	.8	.8	6.4	3.1	.9	3.5	1.7
Louisiana	3.1	.1	.5	.6	.1	6.3	.1	4.6	8.2	.3	.3	3.5	1.8	.5	1.3	1.2
Alabama	2.5	.1	.6	1.0	.1	5.8	.4	6.3	4.7	.1	.3	4.1	1.4	.3	1.1	1.1
Connecticut	3.5	.4	3.0	1.9	.2	7.1	.4	2.8	8.3	.9	1.5	5.6	1.6	.8	2.8	1.4
Kentucky	2.7	.1	.6	.7	.1	6.2	.3	5.8	5.3	.2	.2	3.1	1.6	.4	1.0	1.0
Colorado	2.8	.2	1.7	1.7	.3	5.3	.5	3.8	7.8	.9	.9	4.5	1.9	.7	2.7	1.5
South Carolina	2.6	.1	.6	1.4	.1	5.3	.4	5.1	3.9	.3	.2	2.9	1.1	.3	.9	.9
Iowa	2.7	.1	.6	.9	.2	5.2	.9	4.6	4.7	.2	.4	2.9	1.0	.5	1.2	.8
Oklahoma	2.1	.2	.6	.9	.1	5.4	.4	5.9	5.8	.3	.3	3.2	1.2	.3	1.4	1.0
Oregon	2.2	.1	1.0	.9	.3	6.1	.5	4.0	5.3	.6	.5	3.6	1.5	.5	1.8	1.1
Arizona	1.9	.2	1.0	1.3	.2	4.6	.4	2.9	5.0	.5	.5	3.6	1.6	.6	2.2	1.1
Kansas	2.5	.1	.6	1.2	.1	3.8	.5	4.6	4.8	.2	.4	2.7	.8	.4	1.3	1.0
Mississippi	2.1	.1	.2	.4	.1	2.9	.2	4.0	3.3	.1	.1	2.1	.8	.2	.5	.5
Arkansas	1.5	.1	.4	.3	(')	2.9	.2	4.5	2.7	.1	.1	1.8	.4	.3	.9	.6
Nebraska	1.7	.1	.4	.3	(')	3.0	.4	2.6	3.4	.1	.2	1.6	.7	.2	1.5	.5
West Virginia	.9	.1	.3	.4	(')	2.9	.1	2.6	2.2	.1	.1	1.5	.5	.2	.3	.4
Utah	1.3	.1	.5	.5	.1	2.2	.1	.3	2.3	.2	.3	1.8	.4	.3	.9	.6
New Mexico	1.1	.1	.2	.5	.1	2.5	.1	1.4	2.4	.3	.3	1.4	.7	.2	1.5	.5
Maine	1.0	.1	.2	.4	(')	2.2	.2	1.4	1.8	.2	(')	.9	.5	.1	.6	.4
New Hampshire	1.2	.1	.5	.3	.1	1.5	.1	1.0	1.5	.2	.4	1.3	.4	(')	.7	.2
Rhode Island	1.0	.1	.2	.5	.1	2.4	.2	1.0	1.7	.2	.2	1.8	.5	.2	.6	.4
Hawaii	.8	.1	.2	.2	(')	1.7	.1	.9	1.8	.2	.1	1.2	1.1	.2	1.1	.6
Nevada	.6	(')	.2	.3	.1	1.4	.1	.6	1.5	.2	.1	1.1	1.5	.2	.5	.6
Idaho	.7	.1	.2	.3	(')	1.1	.1	1.0	1.5	.1	.1	.7	.3	.2	.4	.3
Montana	.7	.1	.2	.2	(')	1.3	.1	1.3	1.5	.2	.1	.5	.3	.1	.5	.3
District of Columbia	1.6	.5	2.7	.6	.1	2.4	.2	.8	10.2	.9	1.2	1.1	.4	.4	.8	.6
South Dakota	.7	(')	.1	.2	(')	1.4	.1	1.3	1.0	.1	(')	.4	.3	.2	.2	.2
North Dakota	.5	(')	.1	.2	(')	.9	.2	1.2	.9	(')	.1	.4	.3	.1	.1	.2
Delaware	.6	.1	.4	.2	(')	1.2	.1	.6	1.2	.1	.1	.8	.2	.1	.3	.2
Vermont	.8	(')	.1	.2	(')	1.1	.1	.5	1.1	.1	.2	.6	.2	.1	.5	.2
Wyoming	.5	.1	.1	.2	(')	.6	.1	.5	.8	.1	.1	.4	.1	(')	.2	.2
Alaska	.5	.1	.2	.2	(')	.8	(')	.8	1.3	.1	(')	.4	.2	.1	.3	.2

(') Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Writers, artists, entertainers, and athletes—Continued				Technicians and related support occupations												Technicians, except health, engineering, and science
					Health technologists and technicians					Engineering and related technologists and technicians							
	Dancers	Editors and reporters	Public relations specialists	Announcers	Clinical laboratory technologists and technicians	Dental hygienists	Health record technologists and technicians	Radiologic technicians	Licensed practical nurses	Electrical and electronic technicians	Industrial engineering technicians	Mechanical engineering technicians	Drafting occupations	Surveying and mapping technicians	Science technicians	Airplane pilots and navigators	
United States	11.6	202.8	115.1	44.6	238.4	45.4	14.8	94.3	425.0	261.0	10.3	15.1	319.4	48.8	185.5	74.1	
California	**1.9**	**24.1**	**16.3**	**3.7**	**24.1**	**4.8**	**1.8**	**10.2**	**37.2**	**47.2**	**.6**	**2.0**	**37.7**	**3.9**	**16.7**	**11.7**	
New York	**2.1**	**32.6**	**12.6**	**2.5**	**19.0**	4.3	1.0	6.7	**29.6**	**18.5**	.5	.9	**19.7**	**1.8**	**11.5**	1.9	
Texas	**.7**	**9.0**	**6.3**	**3.2**	**13.8**	**2.2**	**.8**	**5.2**	**33.3**	**19.8**	.3	**.6**	**27.1**	**4.6**	**14.9**	**8.2**	
Illinois	.3	**12.3**	**6.0**	**1.7**	**15.6**	**1.8**	**.8**	**5.3**	**17.8**	**10.5**	.5	.6	**16.7**	1.0	**8.5**	**3.3**	
Pennsylvania	.3	**8.6**	**4.5**	**1.7**	**12.2**	**2.1**	**.4**	**5.3**	**23.8**	**10.6**	.5	.5	**21.9**	**1.8**	**10.1**	1.9	
Ohio	.4	7.4	**4.3**	**1.7**	**11.3**	**2.1**	**.7**	**5.0**	**24.5**	8.8	.4	**.8**	**16.5**	**1.8**	**9.4**	1.5	
Florida	**.8**	**6.5**	**4.2**	**2.2**	**9.9**	**2.2**	**.7**	**4.1**	**16.7**	**11.4**	**.8**	.5	**10.2**	**3.3**	**5.4**	**6.7**	
Michigan	.1	5.3	3.6	**1.5**	**9.5**	**2.4**	**.7**	**4.1**	**19.9**	5.9	**.4**	**1.8**	**18.1**	.9	**6.6**	1.2	
New Jersey	**.4**	**8.5**	**4.0**	.6	**7.0**	**1.4**	**.4**	**3.0**	**11.7**	**8.8**	.3	.4	**10.3**	1.2	**11.4**	**2.1**	
Massachusetts	.2	**7.9**	3.6	.8	**7.9**	**2.0**	**.4**	**3.0**	**13.1**	**10.8**	.2	**.6**	9.7	.9	4.8	.8	
North Carolina	**.2**	**3.1**	**1.6**	**1.5**	**6.8**	**1.5**	**.3**	**2.3**	**9.6**	**4.0**	**.5**	.2	**5.1**	**1.7**	**4.7**	**.8**	
Indiana	.3	3.4	2.1	1.1	5.1	.8	.3	2.3	7.8	4.9	.2	**.6**	6.9	.7	5.3	.8	
Virginia	**.1**	**6.9**	**3.8**	**1.4**	**5.1**	**.7**	**.3**	**2.1**	**10.0**	**7.6**	**.3**	**.4**	**6.4**	**1.5**	**4.3**	**1.5**	
Georgia	.2	2.8	2.2	**1.2**	6.2	1.4	.3	2.0	11.3	4.4	**.4**	.3	5.1	**1.6**	3.1	**3.8**	
Wisconsin	**.2**	**3.8**	**1.9**	**1.1**	**5.6**	**1.2**	**.4**	**2.5**	**10.4**	**3.7**	**.5**	.3	**7.5**	.3	**4.3**	.8	
Missouri	.1	3.7	2.4	1.0	5.9	.5	**.4**	1.9	9.9	3.6	.2	.2	7.5	.9	3.8	1.6	
Maryland	**.3**	**6.2**	**3.6**	**.8**	**5.9**	**.9**	**.4**	**1.9**	**5.9**	**8.2**	.1	.3	**6.3**	**1.2**	**3.7**	.6	
Tennessee	.1	2.8	1.7	1.1	5.3	.7	.3	1.7	10.6	3.2	.4	.3	5.0	1.0	4.0	1.5	
Minnesota	**.1**	**3.5**	**2.2**	**.9**	**5.4**	**1.1**	**.4**	**1.9**	**10.2**	**7.0**	.2	.3	**6.3**	.7	**3.4**	**1.8**	
Washington	.2	3.1	2.1	.9	3.8	1.2	.3	1.8	7.4	5.2	.1	.1	7.7	1.2	2.5	**2.4**	
Louisiana	**.1**	**1.8**	**1.4**	**.9**	**3.8**	**.5**	**.3**	**1.8**	**8.5**	**2.7**	**.2**	**.2**	**4.9**	**2.0**	**4.8**	**1.9**	
Alabama	.1	1.7	1.3	1.1	3.3	1.1	.3	1.5	9.2	2.9	.3	.3	3.6	.9	2.7	.6	
Connecticut	**.2**	**3.8**	**2.5**	**.5**	**3.1**	**1.0**	**.2**	**1.5**	**6.1**	**4.4**	**.2**	**.5**	**5.6**	**.4**	**3.3**	**1.8**	
Kentucky	.2	1.9	1.1	.8	3.4	.4	.2	1.2	5.4	1.7	.1	.2	3.3	.7	2.4	.3	
Colorado	**.2**	**2.5**	**2.3**	**.8**	**3.2**	**.7**	**.3**	**1.1**	**4.1**	**4.7**	**.1**	**.3**	**6.3**	**.9**	**3.0**	**2.6**	
South Carolina	(*)	1.6	1.1	.7	2.7	.5	.2	1.0	5.8	2.8	**.5**	.4	3.1	.7	3.7	.3	
Iowa	**.1**	**2.5**	**1.1**	**.8**	**2.6**	**.4**	**.2**	**1.0**	**6.2**	**2.5**	**.2**	**.1**	**3.0**	**.4**	**2.2**	**.4**	
Oklahoma	.1	2.0	1.4	.8	3.1	.4	.2	1.3	6.4	2.8	.1	.1	4.7	.7	2.3	.8	
Oregon	**.1**	**2.0**	**1.3**	**.7**	**2.4**	**.6**	**.2**	**1.0**	**3.2**	**3.2**	.1	.1	**3.7**	.9	1.5	.5	
Arizona	.2	2.0	1.4	.6	2.5	.5	**.4**	1.0	3.3	5.4	.2	.2	3.9	1.2	1.7	1.2	
Kansas	(*)	**2.1**	**1.0**	**.7**	**2.6**	**.4**	**.2**	**1.2**	**4.2**	**1.9**	(*)	.2	**3.0**	.5	1.6	.9	
Mississippi	(*)	1.1	.7	.6	2.1	.2	.2	.9	5.7	1.4	.1	.1	2.0	1.0	1.5	.5	
Arkansas	(*)	**1.2**	**.6**	**.6**	1.6	**.3**	**.1**	**.8**	**6.1**	**1.0**	.1	(*)	1.4	.5	1.2	.7	
Nebraska	(*)	1.3	.7	.4	2.1	.3	.1	.7	3.3	1.2	(*)	.1	1.6	.4	.9	.2	
West Virginia	(*)	**1.0**	**.4**	**.4**	**1.7**	**.4**	**.1**	**.7**	**3.4**	**.8**	.1	.1	1.3	.8	2.1	.3	
Utah	.1	1.3	.7	.2	1.5	.1	.1	.5	2.2	2.3	(*)	.1	2.7	.6	1.1	.4	
New Mexico	(*)	**.8**	**.6**	**.3**	**1.1**	**.2**	**.1**	**.5**	**1.9**	**2.6**	(*)	.2	**1.9**	**.7**	**1.1**	**.4**	
Maine	(*)	.8	.4	.3	1.3	.3	(*)	.5	2.3	.8	.2	(*)	.8	.2	.7	.3	
New Hampshire	(*)	**.8**	**.4**	**.2**	**.8**	**.2**	**.1**	**.4**	**1.6**	**2.3**	.1	.1	**1.5**	**.2**	**.8**	**.8**	
Rhode Island	(*)	.7	.4	.2	1.1	.2	.1	.6	2.2	.9	(*)	(*)	1.5	.1	.7	.1	
Hawaii	**.4**	**.7**	**.7**	**.2**	**.8**	**.1**	**.1**	**.3**	**1.5**	**1.3**	(*)	(*)	**1.2**	**.2**	**.5**	**.6**	
Nevada	**.5**	.5	.6	.3	.7	.1	(*)	.3	1.2	1.1	(*)	.1	1.0	.4	.5	.8	
Idaho	(*)	**.6**	**.4**	**.3**	**.7**	**.1**	**.1**	**.4**	**1.7**	**.9**	(*)	(*)	**1.1**	**.3**	**1.2**	**.4**	
Montana	(*)	.6	.4	.3	.7	.1	.1	.3	1.4	.4	(*)	(*)	.7	.4	.7	.3	
District of Columbia	.1	**3.7**	**1.8**	**.2**	**.8**	(*)	**.1**	**.2**	**1.0**	**.7**	(*)	(*)	**.6**	**.1**	**.3**	(*)	
South Dakota	(*)	.5	.2	.2	.7	.1	(*)	.2	1.3	.3	(*)	(*)	.4	.2	.4	.1	
North Dakota	(*)	**.6**	**.3**	**.3**	**.7**	**.1**	**.1**	**.3**	**1.7**	**.4**	(*)	(*)	**.5**	**.3**	**.6**	**.1**	
Delaware	(*)	.3	.3	.1	.8	.2	(*)	.3	1.0	.8	.1	.1	.8	.2	2.3	.1	
Vermont	(*)	**.5**	**.2**	**.1**	**.4**	**.2**	(*)	**.2**	**1.3**	**1.3**	**.1**	(*)	**.7**	**.1**	**.5**	**.1**	
Wyoming	(*)	.4	.2	.2	.3	.1	(*)	.2	.5	.4	(*)	(*)	.7	.3	.7	.1	
Alaska	.1	.4	.3	.2	.2	.1	(*)	.1	.2	.7	(*)	(*)	.5	.3	.3	1.1	

(*) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Technicians and related support occupations—Continued					Sales occupations								Administrative support occupations, including clerical		
	Technicians, except health, engineering, and science—Continued					Sales representatives, finance and business services								Secretaries, stenographers, and typists		
	Air traffic controllers	Broadcast equipment operators	Computer programmers	Tool programmers, numerical control	Legal assistants	Insurance sales occupations	Real estate sales occupations	Securities and financial services sales occupations	Advertising and related sales occupations	Sales occupations, other business services	Sales representatives, commodities except retail	Sales workers, retail and personal services	Computer equipment operators	Secretaries	Stenographers	Typists
United States	40.1	69.8	313.2	8.4	76.4	558.2	644.1	130.6	110.0	359.8	1268.2	5122.5	408.5	3870.6	85.8	700.6
California	4.1	7.6	42.6	1.0	9.1	56.5	123.4	17.5	12.6	48.0	139.1	572.9	49.2	385.5	9.6	85.3
New York	2.7	4.9	30.2	.7	7.7	38.6	29.6	24.9	13.6	33.7	101.5	363.8	34.4	337.5	12.9	78.4
Texas	3.4	4.4	21.0	.3	6.0	37.3	48.9	7.6	6.9	23.2	100.3	353.4	28.9	265.9	4.7	39.8
Illinois	2.0	3.6	17.8	.5	3.3	31.7	25.4	10.0	6.7	23.1	72.3	258.7	26.7	208.7	4.4	41.9
Pennsylvania	1.0	2.7	15.6	.4	4.1	26.5	17.9	4.7	4.9	15.6	63.4	252.6	19.1	204.2	5.0	41.9
Ohio	1.5	3.4	13.0	.4	3.2	24.7	24.7	3.2	4.8	14.7	61.3	235.6	18.0	181.4	3.4	30.8
Florida	3.1	3.7	9.0	.3	3.9	27.3	54.2	7.0	5.1	19.4	54.4	256.5	14.9	168.6	3.5	23.9
Michigan	.7	2.1	10.0	.4	1.7	18.8	20.8	2.8	4.2	12.2	45.9	200.9	14.6	146.3	2.7	28.2
New Jersey	.6	2.3	15.2	.5	2.6	18.7	17.6	8.3	3.7	15.5	50.1	163.2	16.6	152.4	3.3	33.7
Massachusetts	.5	1.4	12.2	.4	1.9	14.2	11.3	4.2	2.9	10.1	33.4	127.7	12.7	115.5	1.6	21.3
North Carolina	.6	1.2	5.6	.2	1.1	14.6	10.4	1.2	2.1	6.3	33.6	125.3	8.9	91.6	1.1	8.9
Indiana	1.1	1.8	4.7	.2	1.1	14.0	10.5	1.3	2.2	6.5	28.0	123.9	9.3	85.2	1.7	13.2
Virginia	1.7	1.6	10.1	.1	3.6	12.9	17.0	1.9	1.9	7.4	23.5	119.7	10.7	105.2	2.5	18.5
Georgia	1.4	2.3	5.7	.1	1.0	17.2	13.2	2.3	2.1	9.1	35.4	119.1	10.2	89.6	1.4	11.7
Wisconsin	.4	1.3	5.6	.2	1.1	11.8	9.2	1.4	2.1	6.3	25.3	105.7	7.4	72.3	1.8	13.2
Missouri	.7	1.5	6.4	.1	1.1	13.2	12.1	1.9	2.1	7.5	28.9	108.5	9.6	79.2	2.1	16.6
Maryland	.9	1.4	11.4	.3	2.4	9.8	11.3	1.9	1.8	8.0	20.1	99.1	11.0	97.1	2.0	20.9
Tennessee	1.1	1.3	3.8	.1	.7	12.2	10.0	1.6	1.8	5.9	25.4	97.8	7.5	68.9	1.2	9.2
Minnesota	.8	1.0	9.4	.2	.9	12.0	11.1	2.7	2.1	8.0	26.9	98.8	7.1	73.4	1.3	12.8
Washington	1.0	1.3	5.5	.1	2.1	9.7	18.5	1.8	2.1	6.6	25.0	94.7	6.8	61.2	1.3	11.5
Louisiana	.6	1.2	2.5	.1	1.1	10.4	7.6	.9	1.4	5.3	22.7	93.4	5.6	61.8	2.0	11.7
Alabama	.5	1.4	2.7	.1	.7	10.8	6.9	.8	1.1	3.7	18.8	77.4	4.9	52.1	1.9	7.7
Connecticut	.3	.6	6.6	.4	.7	9.8	8.9	2.7	2.0	6.5	19.0	69.2	7.1	63.2	.8	12.6
Kentucky	.3	1.0	2.2	.1	.5	7.7	6.0	.8	1.2	3.2	14.8	72.6	4.5	46.5	1.2	7.9
Colorado	1.1	1.2	6.6	.2	1.8	8.1	17.8	2.6	1.5	6.1	17.1	72.3	6.7	54.1	.8	8.5
South Carolina	.4	1.1	2.5	.1	.6	8.2	6.1	.8	.9	3.7	14.6	65.8	3.9	48.2	.9	4.3
Iowa	.3	.9	2.6	.1	.7	8.6	5.8	.9	1.6	3.3	16.2	67.1	4.5	46.2	.8	6.5
Oklahoma	.9	1.1	3.9	.1	1.4	6.7	7.6	1.5	1.6	3.8	16.4	72.7	5.3	53.8	1.2	9.0
Oregon	.2	.8	3.0	(*)	1.0	6.9	12.1	1.2	1.4	3.8	14.5	60.9	4.1	40.1	.7	5.7
Arizona	.6	1.0	3.7	.2	1.1	6.5	16.6	1.6	1.4	5.1	12.9	65.9	4.7	41.5	.6	6.0
Kansas	.7	.9	3.0	.1	.8	6.9	6.1	1.1	1.3	3.3	14.7	56.2	4.3	42.7	.8	7.2
Mississippi	.3	.8	.9	(*)	.4	5.4	2.8	.5	.9	2.0	10.2	49.2	2.4	32.4	.5	3.9
Arkansas	.2	.9	.9	(*)	.6	4.3	4.2	.6	.9	1.6	9.6	45.5	2.5	29.7	.5	4.1
Nebraska	.2	.7	1.9	(*)	.4	5.5	3.4	.8	.8	2.1	8.9	38.1	2.1	25.5	.6	3.9
West Virginia	.3	.6	.8	(*)	.3	3.1	2.1	.3	.4	1.4	6.7	32.3	1.8	24.5	.6	3.0
Utah	.5	.4	2.3	(*)	.6	2.5	5.4	.9	.7	2.4	7.4	32.4	2.7	25.6	.3	3.0
New Mexico	.5	.7	1.6	(*)	.5	2.6	4.5	.4	.4	1.4	4.8	26.0	2.2	21.3	.4	3.2
Maine	.1	.5	.7	(*)	.2	2.4	1.8	.3	.4	.8	4.3	22.3	1.2	15.0	.2	2.3
New Hampshire	.4	.4	1.9	(*)	.2	2.3	2.7	.3	.4	1.2	5.6	20.9	1.6	16.1	.2	2.5
Rhode Island	(*)	.2	1.1	(*)	.2	2.4	2.1	.3	.4	1.2	5.1	20.7	1.6	14.6	.5	3.3
Hawaii	.4	.3	.7	(*)	.4	2.2	5.1	.7	.4	2.3	4.5	26.9	1.1	13.7	.9	4.0
Nevada	.2	.4	.7	(*)	.2	1.5	4.5	.3	.5	1.7	2.8	27.8	1.2	13.0	.2	1.6
Idaho	.2	.3	.7	(*)	.2	2.1	3.8	.4	.6	1.1	4.2	20.0	1.2	13.7	.2	1.5
Montana	.2	.3	.3	(*)	.3	2.0	2.4	.3	.5	.9	3.3	18.4	1.1	12.1	.2	1.6
District of Columbia	.1	.2	1.8	(*)	2.0	.6	1.4	.3	.2	.9	.8	10.8	2.2	16.5	.3	6.0
South Dakota	.2	.4	.4	(*)	.2	2.0	1.3	.2	.4	.6	3.4	16.1	.7	10.8	.2	1.1
North Dakota	.1	.1	.4	(*)	.2	1.6	1.1	.2	.4	.7	2.7	15.4	.6	9.8	.2	1.2
Delaware	.1	.1	1.0	(*)	.3	1.3	1.1	.2	.2	.8	2.6	14.3	1.1	12.7	.3	2.1
Vermont	.1	.2	.5	(*)	.1	1.1	1.3	.1	.2	.5	2.1	10.3	.7	8.6	.1	1.0
Wyoming	.1	.1	.2	(*)	.1	.8	1.3	.2	.2	.5	2.1	9.9	.5	8.1	.1	.9
Alaska	.7	.3	.3	(*)	.3	.5	1.2	.2	.2	.6	1.0	7.7	.7	6.8	.1	1.4

(*) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

Administrative support occupations, including clerical—Continued

	Information clerks			Records processing occupations, except financial				Financial records processing occupations				Communications equipment operators	Mail and message distributing occupations			Other material recording, scheduling, and distributing clerks	
	Interviewers	Receptionists	Order clerks	Library clerks	File clerks	Records clerks	Bookkeepers, accounting and auditing clerks	Payroll and timekeeping clerks	Billing clerks	Duplicating, mail and other office machine operators	Telephone operators	Postal clerks, except mail carriers	Mail carriers, postal service	Mail clerks, except postal service	Production coordinators	Traffic, shipping, and receiving clerks	
United States	134.0	516.5	311.3	140.7	277.6	127.4	1827.9	159.3	129.4	58.7	292.2	267.0	256.6	168.0	254.6	482.0	
California	**15.7**	**66.5**	**39.9**	**15.9**	**32.7**	**16.9**	**217.9**	**16.0**	**13.6**	**6.7**	**41.0**	**30.7**	**27.5**	**16.9**	**34.6**	**53.7**	
New York	**11.2**	**45.0**	**29.3**	**14.4**	**33.0**	**11.8**	**154.0**	**14.7**	**14.2**	**6.2**	**27.1**	**30.9**	**23.5**	**20.5**	**22.0**	**39.6**	
Texas	**8.1**	**34.8**	**20.0**	**6.4**	**19.6**	**9.3**	**131.5**	**9.6**	**7.4**	**3.1**	**19.2**	**14.4**	**15.5**	**10.2**	**14.1**	**29.7**	
Illinois	7.2	27.7	22.4	7.9	17.4	7.3	96.7	10.1	9.1	3.4	16.3	18.0	14.2	11.8	14.1	31.3	
Pennsylvania	**7.7**	**23.2**	**17.9**	**7.0**	**15.0**	**4.9**	**73.3**	**10.6**	**9.2**	**3.4**	**12.6**	**14.3**	**14.0**	**9.2**	**15.1**	**29.1**	
Ohio	**5.5**	**23.4**	**16.1**	7.1	11.1	5.1	73.8	9.3	7.4	2.9	11.8	12.1	12.0	8.0	14.9	25.9	
Florida	**5.4**	**21.4**	**10.2**	3.7	9.3	**5.0**	**81.4**	4.0	3.3	1.9	**15.5**	**9.7**	**10.8**	5.4	8.1	15.0	
Michigan	**4.4**	**23.1**	**13.6**	**6.0**	10.9	4.0	**58.7**	**6.6**	**6.4**	**2.2**	**10.4**	8.9	**10.2**	**5.7**	**10.7**	17.5	
New Jersey	**4.7**	**17.0**	**13.4**	**4.9**	**11.2**	**4.3**	**64.0**	**6.0**	**5.9**	**2.7**	10.3	**12.0**	**9.7**	**6.8**	7.9	**19.3**	
Massachusetts	3.8	11.8	8.9	**6.4**	8.8	2.8	48.5	5.0	4.8	1.8	9.3	7.9	7.8	5.2	**8.6**	**19.6**	
North Carolina	**3.0**	**9.9**	**5.7**	**3.3**	**5.9**	**2.9**	**37.8**	**3.7**	**2.6**	**1.0**	**5.7**	**4.6**	**5.2**	**2.7**	**6.1**	17.5	
Indiana	2.6	12.0	7.6	3.6	6.0	3.0	40.7	4.5	3.3	1.3	5.8	5.6	5.7	3.7	7.8	12.2	
Virginia	**2.5**	**11.4**	**5.3**	**3.4**	**5.4**	**2.4**	**37.4**	**3.1**	**1.9**	**1.4**	**6.3**	5.1	**5.7**	**3.6**	5.6	**8.7**	
Georgia	2.7	10.1	7.3	2.3	5.1	3.0	37.1	3.3	2.3	.9	6.3	4.6	5.1	3.5	5.3	16.8	
Wisconsin	**2.8**	**11.1**	**5.6**	**3.6**	**5.3**	**2.8**	**41.0**	**4.1**	**2.9**	**1.0**	4.1	**4.7**	**5.2**	**3.2**	4.8	10.4	
Missouri	2.6	10.6	7.0	2.7	6.4	2.9	40.1	3.6	2.8	1.2	6.1	6.6	6.4	4.4	4.7	9.6	
Maryland	**2.0**	**10.5**	**5.0**	**2.7**	**6.1**	**2.3**	**30.9**	**3.0**	**2.1**	**1.7**	**5.6**	**6.4**	**5.3**	**4.9**	4.7	5.9	
Tennessee	2.0	8.3	4.7	1.7	4.1	2.5	30.9	2.9	1.9	1.2	5.2	4.0	4.8	2.9	4.0	11.4	
Minnesota	**2.9**	**11.3**	**5.5**	**3.1**	**4.3**	**2.3**	**41.0**	**2.5**	**2.1**	**1.2**	**3.9**	**4.9**	**4.7**	**3.5**	**4.8**	9.1	
Washington	2.8	12.8	5.9	3.1	5.8	2.6	38.8	2.9	2.5	1.1	4.3	4.4	4.5	2.8	5.0	7.3	
Louisiana	**1.7**	**8.9**	**3.3**	**1.3**	**3.5**	**1.9**	**28.3**	**2.1**	**1.5**	.7	5.3	**3.7**	**3.8**	**1.8**	2.5	5.8	
Alabama	1.6	6.4	3.6	1.5	3.2	1.7	25.4	2.3	1.3	.6	4.0	2.9	3.4	1.6	3.3	7.1	
Connecticut	**1.9**	**7.5**	**4.8**	**2.7**	**4.2**	**2.0**	**27.5**	**3.3**	**2.4**	.7	**4.2**	**4.2**	**3.8**	**2.8**	5.4	7.9	
Kentucky	1.5	6.4	3.8	1.6	3.1	1.8	25.0	2.5	1.6	.7	3.2	3.0	3.2	1.7	3.2	5.9	
Colorado	**2.6**	**8.0**	**4.1**	**2.0**	**3.4**	**1.6**	**30.1**	**1.9**	**1.3**	**1.0**	**4.0**	**4.0**	**3.7**	**2.4**	3.3	5.4	
South Carolina	1.2	4.2	2.8	1.1	3.3	1.2	19.9	2.1	.8	.6	2.9	2.0	2.7	1.5	3.8	6.8	
Iowa	**1.1**	**6.0**	**3.0**	**2.0**	**2.7**	**1.9**	**28.9**	**1.3**	**1.1**	**.8**	**2.8**	**3.3**	**3.5**	**2.2**	3.3	4.3	
Oklahoma	1.8	6.8	4.4	1.1	3.6	1.4	27.3	1.9	1.3	.6	4.3	3.0	3.3	1.9	2.8	4.7	
Oregon	**1.8**	**7.7**	**3.4**	**2.1**	**2.7**	**1.7**	**24.8**	**1.6**	**1.5**	**.6**	**3.1**	**2.7**	**3.2**	**1.5**	1.7	4.4	
Arizona	2.4	5.7	3.1	1.5	2.3	1.6	19.3	1.3	1.0	.7	3.2	2.7	2.7	1.7	2.4	3.3	
Kansas	**1.3**	**5.5**	**3.1**	**1.7**	**3.0**	**1.7**	**24.0**	**1.5**	**1.2**	**.6**	**2.9**	**2.8**	**3.1**	**1.6**	2.5	**4.0**	
Mississippi	1.0	3.5	1.9	1.0	1.9	1.4	15.0	1.2	.5	.3	2.8	1.6	2.3	1.1	1.6	4.5	
Arkansas	**1.0**	**3.5**	**2.1**	**1.0**	**1.8**	**1.3**	**16.0**	**1.1**	**.9**	**.4**	**2.3**	**1.8**	**2.3**	**.8**	1.3	**3.4**	
Nebraska	1.4	3.3	1.4	1.0	1.6	.8	16.3	.7	.7	.3	2.0	1.9	2.2	1.1	1.0	2.6	
West Virginia	**.6**	**2.9**	**1.4**	**.7**	**1.2**	**.7**	**9.7**	**1.1**	**.8**	**.3**	**2.2**	**1.8**	**1.8**	**.6**	1.3	**2.4**	
Utah	1.0	2.9	1.6	.7	1.5	.7	10.0	.6	.6	.3	1.3	1.3	1.2	1.0	1.7	2.6	
New Mexico	**1.2**	**2.4**	**1.1**	**.6**	**1.1**	**.7**	**10.7**	**.6**	**.3**	**.2**	**1.2**	**1.2**	**1.2**	**.6**	.8	**1.1**	
Maine	1.0	1.9	1.1	1.0	.7	.4	8.2	.8	.6	.1	1.1	1.5	1.4	.5	.9	1.9	
New Hampshire	**.4**	**2.1**	**1.4**	**.8**	**1.4**	**.5**	**8.0**	**.8**	**.6**	**.2**	**1.1**	**1.0**	**1.1**	**.7**	1.5	**2.5**	
Rhode Island	.5	1.9	1.5	.9	1.5	.4	7.4	1.0	.8	.2	1.0	1.1	1.2	.6	1.5	3.2	
Hawaii	**.9**	**2.4**	**1.0**	**.8**	**.9**	**.5**	**8.2**	**.6**	**.5**	**.3**	**1.3**	**.9**	**.7**	**.5**	.9	**1.2**	
Nevada	.6	2.1	1.0	.5	.8	.6	7.5	.7	.3	.3	2.4	.9	.8	.4	.6	1.5	
Idaho	**1.1**	**2.1**	**.9**	**.5**	**.7**	**.4**	**9.8**	**.6**	**.2**	**.2**	**1.0**	**.8**	**.9**	**.5**	.6	.9	
Montana	1.0	1.6	.6	.3	.4	.3	9.0	.3	.2	.2	1.1	1.0	.9	.3	.3	.7	
District of Columbia	**.4**	**2.4**	**.5**	**.9**	**1.8**	**.5**	**3.4**	**.5**	**.1**	**.6**	**1.0**	**2.2**	**.9**	**1.9**	.6	.7	
South Dakota	.8	1.3	.6	.4	.5	.3	6.9	.3	.2	.1	.5	.8	.8	.4	.3	.6	
North Dakota	**.6**	**1.2**	**.5**	**.4**	**.2**	**.3**	**6.6**	**.2**	**.2**	**.1**	**.5**	**.8**	**.7**	**.2**	.2	.4	
Delaware	.4	1.2	.7	.4	.6	.3	4.5	.4	.4	.1	.6	.5	.6	.5	1.0	1.0	
Vermont	**.2**	**.9**	**.5**	**.6**	**.4**	**.2**	**4.7**	**.3**	**.2**	**.1**	**.6**	**.6**	**.5**	**.3**	.6	.8	
Wyoming	.7	.8	.5	.3	.2	.3	5.8	.3	.2	.1	.6	.6	.4	.2	.3	.2	
Alaska	**.7**	**1.1**	**.2**	**.3**	**.5**	**.2**	**4.3**	**.3**	**.1**	**.1**	**.6**	**.7**	**.3**	**.2**	.3	.4	

(*) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Other material recording, scheduling, and distributing clerks—Continued: Stock and inventory clerks	Adjusters and investigators: Insurance adjusters, examiners, and investigators	Adjusters and investigators: Investigators and adjusters, except insurance	Miscellaneous administrative support occupations: General office clerks	Miscellaneous administrative support occupations: Bank tellers	Miscellaneous administrative support occupations: Data entry keyers	Miscellaneous administrative support occupations: Statistical clerks	Miscellaneous administrative support occupations: Teachers' aides	Private household occupations	Protective service occupations: Firefighting and fire prevention occupations	Protective service occupations: Police and detectives	Protective service occupations: Guards	Service occupations: Food preparation and service occupations	Service occupations: Dental assistants	Health service occupations: Health aides, except nursing	Health service occupations: Nursing aides, orderlies, and attendants
United States	570.9	163.6	243.6	1648.9	494.9	378.1	139.2	206.7	589.4	210.2	557.9	612.6	4384.9	151.8	279.7	1295.5
California	62.9	20.6	36.6	201.5	62.8	45.4	14.8	33.1	66.2	25.1	56.6	63.6	473.1	21.8	29.6	109.0
New York	40.1	14.9	22.6	152.8	41.3	35.2	14.8	19.0	50.2	17.9	63.9	67.6	304.8	12.3	28.9	121.4
Texas	34.1	10.8	12.6	82.5	25.7	25.2	9.3	21.0	47.3	13.0	29.9	31.8	246.7	8.6	13.8	79.9
Illinois	29.2	11.0	17.1	95.3	27.9	24.1	8.4	5.3	18.5	10.4	33.5	33.3	222.0	7.2	12.0	62.3
Pennsylvania	30.5	8.2	8.9	69.9	25.2	20.0	6.6	12.4	20.5	6.5	27.4	35.7	231.4	6.8	15.8	65.6
Ohio	30.9	7.0	10.8	55.5	24.1	18.6	6.1	5.7	21.3	8.8	20.4	28.4	220.2	6.6	15.1	59.9
Florida	24.0	6.5	9.9	80.0	20.7	11.6	4.3	5.6	33.9	10.4	25.9	30.6	283.7	5.7	11.3	46.8
Michigan	23.1	6.0	8.0	54.7	21.1	13.1	4.8	10.4	17.3	6.6	20.8	24.5	191.2	6.7	17.0	54.7
New Jersey	19.3	7.9	8.9	58.4	18.4	16.6	6.3	7.5	14.6	6.9	25.2	29.8	121.7	5.6	10.1	35.4
Massachusetts	15.5	5.1	5.6	47.6	14.5	12.2	3.7	6.5	10.0	11.8	17.1	20.7	124.6	4.0	8.8	43.8
North Carolina	15.3	3.1	5.6	42.9	10.7	7.6	2.4	3.7	20.4	4.0	13.5	12.5	89.7	3.0	5.2	33.0
Indiana	15.0	4.2	4.9	34.5	11.5	8.3	2.9	5.9	10.0	4.5	10.6	13.3	119.5	3.4	6.7	33.6
Virginia	16.1	2.9	5.8	45.5	10.9	8.0	3.5	4.7	22.6	5.2	16.5	15.0	90.2	3.3	5.4	29.9
Georgia	15.5	3.6	6.4	45.1	10.3	8.9	2.9	6.4	23.3	5.9	13.5	13.7	86.1	2.7	5.3	27.3
Wisconsin	13.0	3.6	3.8	30.8	10.1	8.9	2.4	3.3	8.2	3.7	10.3	9.5	121.2	3.5	8.2	36.0
Missouri	11.6	3.6	6.1	34.4	9.7	9.5	3.3	2.7	11.2	4.0	11.0	11.2	101.0	3.2	6.5	34.5
Maryland	13.0	3.1	8.8	54.4	9.9	9.1	5.9	1.7	13.2	5.4	17.1	15.5	74.8	2.9	6.7	23.6
Tennessee	11.4	2.5	4.3	34.9	8.2	6.0	2.2	3.2	14.3	4.8	9.3	11.1	72.6	2.6	5.1	25.3
Minnesota	10.3	3.5	4.0	33.2	8.3	8.6	1.8	1.6	7.0	1.9	7.5	6.7	101.7	3.3	6.6	34.3
Washington	9.9	3.1	3.9	19.1	8.9	7.2	3.0	5.4	8.3	4.2	7.9	8.2	95.7	4.1	5.0	17.0
Louisiana	9.1	2.3	3.2	36.9	8.7	4.1	1.4	2.1	17.7	3.5	11.1	10.7	66.3	2.2	2.9	26.3
Alabama	9.7	1.6	3.6	27.3	6.8	3.8	1.9	2.1	15.9	3.9	7.1	8.6	49.8	1.7	3.9	23.0
Connecticut	9.5	3.0	2.9	25.5	8.3	6.1	2.5	4.1	6.5	4.0	7.4	9.2	59.1	2.2	4.2	20.4
Kentucky	8.9	1.6	2.6	21.6	6.9	3.8	1.7	2.1	9.1	2.5	6.5	9.0	60.6	1.9	4.2	20.2
Colorado	7.2	2.0	4.4	19.6	5.8	5.5	2.2	2.3	5.1	2.6	7.7	6.6	72.5	2.5	2.8	11.8
South Carolina	7.8	1.2	2.6	24.3	5.2	3.4	1.1	2.8	12.0	2.4	6.6	7.9	43.9	1.4	2.1	13.6
Iowa	6.7	1.9	1.9	20.3	6.0	4.1	1.2	1.3	6.3	1.5	4.9	4.6	69.6	2.1	3.9	22.9
Oklahoma	6.9	1.8	2.5	14.0	5.7	5.2	2.2	2.4	6.9	3.1	6.5	5.4	55.8	1.6	3.5	21.1
Oregon	5.4	2.5	3.0	16.8	5.9	4.1	1.5	1.3	4.8	2.9	5.6	5.1	61.8	2.4	2.2	12.7
Arizona	6.8	1.7	3.3	21.0	5.4	4.4	1.5	2.6	5.3	2.3	7.7	7.3	58.9	1.7	2.4	10.2
Kansas	5.7	1.8	1.9	12.9	4.9	4.3	1.7	2.3	5.3	1.9	4.7	3.7	49.2	1.6	3.0	19.0
Mississippi	5.2	1.0	1.6	15.9	4.6	1.8	.7	1.9	11.0	2.5	4.0	5.2	31.4	1.1	1.8	15.6
Arkansas	4.4	.8	1.2	7.7	4.2	2.3	1.1	2.5	6.6	1.8	3.6	4.1	34.4	1.1	2.0	15.1
Nebraska	3.1	1.4	1.1	10.7	3.5	2.8	.7	.6	3.6	1.0	3.1	2.5	38.2	1.3	1.6	11.5
West Virginia	4.1	.7	1.4	14.0	3.5	1.7	.6	.6	4.2	1.0	3.6	3.7	27.3	.9	1.9	10.8
Utah	3.8	.8	1.1	8.9	2.7	2.3	.8	.5	1.9	1.0	2.7	3.1	27.0	1.3	1.0	4.8
New Mexico	2.3	.5	1.2	7.4	2.5	1.8	.5	1.6	3.0	1.7	3.0	3.4	24.8	.7	1.2	4.6
Maine	2.2	.5	.7	4.7	2.6	1.1	.5	1.4	3.1	1.0	2.0	2.6	20.9	.5	1.6	8.3
New Hampshire	2.3	.8	.7	4.2	2.1	1.6	.6	.9	1.8	.9	1.8	1.9	19.4	.4	1.0	3.7
Rhode Island	2.6	.8	.7	6.2	2.2	1.8	.6	1.1	1.4	1.6	2.7	3.0	21.8	.6	1.6	7.6
Hawaii	3.4	.8	1.0	10.0	2.6	1.1	.4	.4	1.5	1.5	2.1	3.4	32.7	.8	.8	2.5
Nevada	2.1	.4	1.1	5.6	3.3	.9	.4	.2	1.0	1.1	3.0	4.9	36.5	.6	.6	2.4
Idaho	1.5	.4	1.1	5.1	1.9	.8	.4	.4	1.6	.8	1.8	1.4	19.9	.8	.6	3.4
Montana	1.2	.4	.5	4.4	1.5	.7	.4	.7	1.3	.8	1.9	1.2	20.9	.5	.6	4.6
District of Columbia	2.0	.4	.9	11.0	.9	1.9	1.4	.2	5.6	.2	1.8	4.6	12.9	.3	1.1	4.3
South Dakota	.9	.3	.4	2.6	1.6	.5	.3	.8	1.8	.3	1.4	.8	17.3	.5	1.1	5.6
North Dakota	1.2	.3	.5	3.3	1.3	.4	.1	.2	1.6	.2	1.1	.8	16.8	.3	1.1	4.9
Delaware	1.3	.3	.8	5.6	1.2	1.0	.3	.4	1.7	.3	1.7	2.3	12.7	.4	.6	3.0
Vermont	1.0	.2	.4	2.9	1.0	.4	.2	1.0	1.8	.2	.8	1.2	11.9	.3	.5	3.0
Wyoming	1.0	.2	.3	2.6	.8	.3	.2	.3	.8	.4	1.2	.9	10.9	.3	.3	1.9
Alaska	.8	.2	.5	2.7	.9	.4	.2	.4	.6	.4	1.2	1.0	7.7	.3	.2	1.3

(*) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Service occupations—Continued					Farming, forestry, and fishing occupations				Mechanics and repairers						
		Personal service occupations								Vehicle and mobile equipment mechanics and repairers						Electrical and electronic equipment repairers
	Cleaning and building service occupations	Barbers	Hairdressers and cosmetologists	Child care workers	Farm operators and managers	Farm occupations, except managerial	Groundskeepers and gardeners, except farm	Forestry and logging occupations	Fishers, hunters, and trappers	Automobile mechanics	Bus, truck, and stationary engine mechanics	Aircraft engine mechanics	Automobile body and related repairers	Heavy equipment mechanics	Industrial machinery repairers	Electronic repairers, communications and industrial equipment
United States	2745.4	103.7	544.0	580.2	1298.7	875.3	355.2	122.7	55.7	905.1	146.2	95.0	193.0	149.8	467.6	158.8
California	**256.3**	**10.5**	**61.4**	**92.7**	**52.6**	**141.5**	**78.6**	**6.0**	**5.2**	**102.3**	**13.1**	**18.7**	**19.4**	**10.6**	**28.0**	**19.1**
New York	218.2	7.1	36.3	35.9	34.3	27.3	21.3	3.0	2.0	58.4	8.8	6.3	10.4	8.2	29.9	11.0
Texas	**167.8**	**7.7**	**36.2**	**38.3**	**78.8**	**63.9**	**24.3**	**3.7**	**3.1**	**63.3**	**10.9**	**8.8**	**12.1**	**10.5**	**25.0**	**11.0**
Illinois	149.2	5.3	28.5	25.5	66.0	25.1	10.5	.8	.4	41.9	8.3	2.7	8.8	7.3	24.1	7.1
Pennsylvania	**141.3**	**5.7**	**28.2**	**18.5**	**35.7**	**24.9**	**11.8**	**3.1**	**.3**	**46.3**	**8.0**	**2.3**	**11.6**	**9.6**	**32.6**	**8.1**
Ohio	132.6	5.2	25.4	18.5	43.3	19.5	12.3	1.7	.4	37.3	9.1	1.7	9.9	8.0	31.7	7.3
Florida	**126.6**	**4.5**	**27.8**	**25.5**	**22.1**	**54.0**	**31.3**	**3.9**	**7.6**	**39.5**	**5.1**	**8.2**	**7.6**	**5.2**	**9.9**	**8.1**
Michigan	118.1	3.8	19.7	25.9	29.5	17.5	8.9	3.0	.4	36.9	6.9	1.4	8.5	5.1	26.3	4.8
New Jersey	**77.7**	**3.4**	**16.1**	**10.3**	**6.0**	**5.7**	**8.9**	**.3**	**1.2**	**30.5**	**4.6**	**1.7**	**6.0**	**3.5**	**17.8**	**5.2**
Massachusetts	68.4	2.4	13.3	10.8	4.0	4.6	7.6	1.0	3.4	21.5	2.4	1.3	5.4	2.3	12.5	3.6
North Carolina	**67.0**	**2.9**	**14.9**	**17.7**	**41.6**	**28.3**	**7.6**	**5.7**	**2.8**	**22.0**	**4.1**	**1.2**	**6.2**	**3.0**	**31.9**	**4.0**
Indiana	70.1	2.3	14.7	9.6	41.6	16.0	5.1	1.0	.1	22.4	3.7	.7	6.1	4.2	16.9	4.2
Virginia	**61.4**	**2.2**	**13.1**	**11.7**	**23.8**	**16.2**	**7.0**	**4.7**	**2.5**	**20.8**	**4.1**	**1.5**	**4.2**	**4.9**	**8.9**	**3.7**
Georgia	66.4	2.5	13.3	10.7	27.7	22.3	7.3	**7.0**	.8	21.5	**4.7**	4.4	4.8	3.4	11.9	4.6
Wisconsin	**63.9**	**2.0**	**10.4**	**11.8**	**72.0**	**34.0**	**4.2**	**3.7**	**.5**	**19.5**	**3.4**	**.6**	**4.3**	**2.0**	**11.0**	**2.7**
Missouri	64.1	2.5	13.0	12.7	**57.2**	20.7	6.3	2.2	.1	22.1	3.3	3.2	4.7	2.9	7.2	3.1
Maryland	**48.9**	**1.9**	**10**	**13.2**	**10.6**	**7.9**	**6.0**	**.5**	**2.2**	**15.9**	**1.9**	**.8**	**3.7**	**3.0**	**6.0**	**2.9**
Tennessee	54.6	2.5	11.8	8.7	27.7	12.7	4.5	3.1	.3	16.7	2.3	.7	4.0	2.6	11.4	3.1
Minnesota	**55.5**	**2.1**	**9.3**	**17.4**	**73.3**	**25.6**	**4.1**	**2.1**	**.3**	**17.6**	**2.5**	**1.9**	**3.9**	**3.4**	**7.2**	**2.7**
Washington	46.1	1.7	9.6	12.5	20.0	23.4	8.8	**10.0**	**3.5**	14.3	4.6	3.2	3.2	3.5	4.7	3.1
Louisiana	**49.6**	**2.1**	**9.4**	**9.6**	**14.8**	**12.0**	**4.1**	**3.3**	**4.2**	**13.7**	**4.1**	**1.5**	**3.2**	**3.1**	**5.7**	**2.6**
Alabama	41.2	1.9	9.1	7.2	16.6	10.4	4.5	**6.6**	1.1	14.0	1.8	1.9	3.3	3.1	9.1	2.5
Connecticut	**33.3**	**1.4**	**7.2**	**5.2**	**3.4**	**4.0**	**4.4**	**.3**	**.4**	**11.8**	**.9**	**1.1**	**2.9**	**1.3**	**7.6**	**2.0**
Kentucky	39.9	1.6	8.1	6.7	37.7	16.1	3.9	2.3	.2	13.9	1.6	.3	3.5	**3.8**	10.0	2.3
Colorado	**38.7**	**1.1**	**6.7**	**10.4**	**18.4**	**11.7**	**4.5**	**.7**	**.2**	**14.1**	**1.3**	**1.3**	**2.5**	**2.4**	**4.2**	**2.3**
South Carolina	40.7	1.4	7.0	7.5	14.1	9.8	3.6	3.2	7	11.2	1.7	.4	2.6	1.7	14.4	2.7
Iowa	**38.8**	**1.3**	**8.6**	**10.0**	**92.3**	**29.0**	**2.6**	**.3**	**.1**	**14.3**	**2.5**	**.3**	**2.8**	**2.1**	**5.7**	**2.1**
Oklahoma	34.2	1.8	7.9	9.2	30.0	11.7	4.5	1.2	.2	12.9	3.8	**5.8**	2.5	1.6	5.0	2.5
Oregon	**32.0**	**.9**	**6.5**	**11.1**	**15.7**	**15.7**	**5.3**	**11.8**	**1.8**	**11.4**	**1.4**	**.5**	**2.0**	**2.1**	**4.2**	**1.5**
Arizona	32.2	1.4	6.4	8.1	5.0	13.8	8.3	.9	.1	14.3	.7	1.7	2.0	2.5	3.7	2.3
Kansas	**29.5**	**1.1**	**6.6**	**7.3**	**46.8**	**15.8**	**2.8**	**.3**	**.1**	**9.9**	**2.4**	**1.9**	**2.0**	**2.2**	**2.7**	**2.0**
Mississippi	27.3	.9	5.2	6.2	16.4	15.6	2.7	**5.4**	.8	9.4	1.5	.5	2.0	1.8	4.5	1.6
Arkansas	**24.3**	**1.2**	**5.5**	**5.2**	**25.0**	**19.2**	**2.9**	**5.0**	**.3**	**8.0**	**2.6**	**.6**	**2.1**	**2.0**	**3.9**	**1.5**
Nebraska	22.1	.9	4.1	6.6	**52.0**	18.9	2.0	.2	(1)	8.3	.9	.3	1.5	1.9	2.4	.9
West Virginia	**21.3**	**.9**	**3.8**	**4.4**	**4.6**	**3.5**	**1.8**	**1.8**	(1)	**6.7**	**.8**	**.2**	**1.5**	**2.7**	**4.4**	**1.1**
Utah	17.3	.5	3.1	4.4	5.7	4.5	1.9	.2	.1	7.1	.8	1.1	1.2	1.6	2.5	1.3
New Mexico	**16.2**	**.6**	**2.6**	**4.4**	**6.1**	**6.4**	**2.4**	**.9**	**.1**	**6.5**	**.8**	**.4**	**1.0**	**1.3**	**2.1**	**1.1**
Maine	12.9	.5	2.5	2.3	4.4	3.9	1.2	3.7	**3.4**	5.2	.6	.3	1.1	.9	3.4	.7
New Hampshire	**10.5**	**.3**	**2.2**	**1.8**	**1.8**	**1.7**	**1.0**	**1.5**	**.2**	**4.2**	**.5**	**.1**	**1.0**	**.6**	**3.4**	**.6**
Rhode Island	11.1	.4	2.3	1.5	.6	.6	1.1	.1	1.0	3.9	.3	.1	.9	.3	3.5	.6
Hawaii	**16.4**	**.6**	**2.0**	**2.0**	**2.5**	**6.3**	**4.1**	**.1**	**.7**	**3.7**	**.5**	**.7**	**.9**	**.7**	**1.2**	**1.0**
Nevada	19.1	.3	2.1	2.1	1.7	2.2	2.0	.1	.1	4.3	.2	.5	.6	.7	.8	.6
Idaho	**11.3**	**.5**	**2.2**	**2.9**	**17.1**	**12.7**	**1.5**	**1.7**	**.2**	**4.0**	**.5**	**.2**	**1.0**	**1.1**	**1.6**	**.6**
Montana	11.0	.3	1.6	3.3	17.9	10.1	.9	1.3	.1	4.1	.3	.2	.7	1.3	.9	.4
District of Columbia	**15.2**	**.3**	**1.2**	**1.1**	**.1**	**.3**	**.9**	(1)	(1)	**.8**	**.1**	**.1**	**.2**	**.1**	**.3**	**.2**
South Dakota	9.1	.3	1.7	2.9	35.0	10.6	.8	.3	.1	3.2	.6	.1	.7	.4	.5	.4
North Dakota	**8.8**	**.3**	**1.5**	**2.5**	**31.4**	**7.8**	**.5**	**.1**	(1)	**3.7**	**.3**	**.1**	**.7**	**.7**	**.6**	**.6**
Delaware	7.3	.3	1.3	1.5	2.3	2.0	1.0	.2	.2	2.2	.3	.3	.7	.6	.9	.6
Vermont	**6.8**	**.2**	**1.0**	**1.5**	**5.3**	**4.1**	**.6**	**1.5**	(1)	**2.5**	**.2**	**.1**	**.6**	**.4**	**1.0**	**.3**
Wyoming	6.8	.2	.8	1.5	5.8	3.9	.6	.3	.1	3.0	.2	.1	.6	1.3	1.7	.4
Alaska	**6.1**	**.1**	**.4**	**1.7**	**.2**	**.3**	**.2**	**.7**	**2.4**	**2.2**	**.2**	**.8**	**.1**	**.6**	**.5**	**.4**

(1) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

State	Mechanics and repairers—Continued					Construction trades, except supervisors						Extractive occupations		Precision production occupations		
		Electrical and electronic equipment repairers—Continued												Precision metal working occupations		
	Data processing equipment repairers	Telephone installers and repairers	Heating, air-conditioning, and refrigeration mechanics	Millwrights	Brickmasons and stonemasons	Carpenters	Electricians	Painters, construction and maintenance	Plumbers, pipefitters, and steamfitters	Structural metal workers	Drillers, oil well	Mining machine operators	Tool-and-die makers	Machinists	Precision woodworking occupations	Precision textile, apparel, and furnishings machine workers
United States	46.6	252.5	143.6	124.4	163.5	1093.7	5717	363.0	450.2	76.6	68.5	85.0	180.0	503.8	110.4	261.3
California	5.6	30.9	12.5	5.1	9.4	113.2	49.0	47.1	40.9	4.7	2.9	1.5	11.5	59.5	13.4	33.9
New York	4.5	21.4	11.6	6.7	8.2	53.9	35.2	22.2	27.2	3.0	.2	.5	12.3	31.6	7.3	24.0
Texas	3.4	18.0	14.6	5.0	11.7	82.8	41.1	35.3	39.2	7.3	20.5	3.2	3.8	36.8	6.4	14.8
Illinois	2.6	11.7	5.2	8.1	6.7	44.0	31.5	15.7	21.5	4.7	.9	4.7	15.0	28.0	3.5	10.8
Pennsylvania	2.5	10.1	7.4	9.5	10.0	45.9	30.8	13.9	24.6	4.5	.8	9.3	10.9	34.1	4.7	13.0
Ohio	2.5	10.0	6.3	13.8	7.5	37.4	28.6	12.4	20.3	3.6	1.3	2.8	20.2	39.1	3.6	8.7
Florida	1.2	14.8	9.6	1.3	8.6	64.0	25.6	22.4	18.6	3.1	.6	.8	2.0	10.4	6.2	12.2
Michigan	1.7	8.5	5.1	13.7	5.6	27.7	23.6	9.8	18.7	2.4	.6	.6	31.9	18.1	4.3	6.6
New Jersey	2.1	9.0	6.0	3.1	6.6	28.5	16.8	9.2	15.4	2.4	.1	.2	6.0	17.5	2.8	7.8
Massachusetts	2.4	6.6	4.3	2.5	3.0	26.6	12.3	8.2	10.3	1.1	(1)	.1	5.3	21.6	2.4	6.6
North Carolina	.6	6.8	4.4	1.8	7.5	34.4	15.2	11.5	9.7	1.4	.2	.4	1.9	9.4	9.2	11.7
Indiana	.7	5.7	3.7	7.9	4.5	22.3	16.9	6.7	11.2	2.7	.2	1.0	10.9	13.5	2.7	4.9
Virginia	1.0	5.9	3.7	1.9	5.8	31.2	15.1	10.5	13.4	2.0	.2	5.7	.9	8.7	4.4	6.0
Georgia	.8	7.2	3.5	1.6	5.3	27.5	13.4	10.6	9.3	1.7	.1	1.0	1.4	7.6	2.6	6.5
Wisconsin	.8	4.2	2.0	4.3	3.0	20.4	10.9	6.0	8.3	1.5	.1	.1	6.2	14.4	1.9	4.5
Missouri	.9	5.5	2.7	1.8	3.1	23.8	11.0	7.5	8.6	2.3	.1	.9	3.0	9.0	1.8	7.1
Maryland	1.2	5.2	3.6	1.6	4.8	22.2	11.3	7.6	8.8	1.5	(1)	.2	1.1	6.6	1.8	4.3
Tennessee	.5	4.6	2.4	1.7	4.3	23.6	13.0	7.6	9.4	2.2	.3	1.6	2.7	9.2	2.6	7.2
Minnesota	1.1	3.7	1.4	2.6	2.5	22.2	8.8	5.5	7.1	1.1	.1	.5	3.2	8.9	2.2	4.2
Washington	1.0	4.9	2.0	3.2	1.7	26.1	12.6	6.0	9.8	2.0	.1	.2	2.3	11.0	2.4	3.8
Louisiana	.5	5.1	2.9	2.3	2.4	25.5	13.8	8.4	14.4	2.5	11.4	1.8	.3	6.4	1.2	3.0
Alabama	.5	4.2	2.1	3.3	3.7	18.8	10.6	6.3	7.7	2.3	.6	2.8	1.0	7.7	2.1	4.6
Connecticut	.9	2.9	2.3	1.8	2.1	14.7	7.6	4.3	7.1	.9	(1)	(1)	7.5	13.7	1.5	3.4
Kentucky	.5	3.6	1.9	1.2	3.1	18.3	9.1	5.0	6.7	1.2	.5	10.7	2.2	5.7	1.2	3.3
Colorado	1.0	3.2	1.3	.8	2.1	20.1	7.8	5.8	6.3	1.2	1.2	3.2	1.2	5.3	1.4	3.6
South Carolina	.3	3.2	1.8	1.5	3.7	18.3	9.3	5.6	7.4	1.1	.1	.3	1.5	6.3	1.4	5.0
Iowa	.3	2.7	1.4	1.3	1.4	14.7	6.6	3.4	5.4	.7	(1)	.2	2.2	6.1	.7	2.8
Oklahoma	.7	3.6	2.6	.6	3.1	17.5	7.7	5.7	6.2	1.2	9.2	1.0	1.0	7.8	1.2	3.0
Oregon	.4	2.9	1.0	3.7	1.0	15.8	6.0	3.9	4.0	.9	.1	.2	.6	4.5	1.9	2.5
Arizona	.7	2.6	1.9	.4	2.8	14.9	6.9	4.7	5.8	1.3	.1	2.5	.8	4.7	1.5	3.1
Kansas	.5	2.7	1.5	.7	1.5	11.8	5.9	3.7	4.6	.8	2.8	.3	1.9	6.1	1.0	2.4
Mississippi	.2	2.2	1.1	.9	1.9	13.7	6.0	4.4	5.1	.9	3.5	.4	.9	3.2	1.1	4.4
Arkansas	.2	2.3	1.6	1.2	2.1	12.8	4.8	3.4	3.5	.9	.8	.3	1.2	3.1	1.0	2.6
Nebraska	.3	1.8	.7	.3	1.1	7.9	3.8	2.1	2.9	.4	.2	(1)	.6	2.5	.5	1.6
West Virginia	.1	1.7	.6	1.4	1.9	9.8	9.1	2.0	4.0	.8	.7	14.9	.5	3.4	.5	1.5
Utah	.4	1.2	.8	.7	1.8	8.4	3.8	2.0	2.3	.6	.7	2.5	.2	2.5	.9	1.7
New Mexico	.3	1.1	.5	.2	.7	7.0	3.7	2.1	3.1	.4	2.0	3.3	.1	1.5	.5	1.4
Maine	.1	.9	.8	1.3	.7	8.0	3.1	1.7	2.9	.3	(1)	.1	.5	3.0	.5	2.3
New Hampshire	.3	.9	.7	.6	.5	6.3	2.4	1.3	2.1	.3	(1)	(1)	.7	4.0	.5	1.3
Rhode Island	.2	.9	.7	.4	.3	4.8	1.9	1.4	2.1	.1	(1)	(1)	1.8	3.2	.5	.9
Hawaii	.1	1.5	.6	(1)	1.3	6.4	2.1	1.6	1.8	.4	(1)	(1)	(1)	.7	.4	1.9
Nevada	.1	1.3	.5	.2	.6	5.2	2.6	1.4	1.8	.3	.2	.7	.1	.7	.3	.9
Idaho	.1	1.1	.4	.5	.5	5.9	2.2	1.3	1.4	.2	.1	1.1	.1	1.0	.5	.8
Montana	.1	.8	.2	.4	.4	5.9	2.1	.7	1.4	.4	.7	.5	(1)	1.2	.2	.9
District of Columbia	.1	.4	.1	(1)	.7	1.4	.7	1.0	.6	.1	(1)	(1)	(1)	.1	.2	.6
South Dakota	.1	.6	.3	.1	.4	4.3	1.6	.8	1.1	.1	(1)	.7	.1	.7	.3	.6
North Dakota	.1	.5	.2	.2	.4	4.0	1.6	.7	1.4	.3	1.1	.1	.1	.5	.2	.6
Delaware	.1	.5	.5	.5	.8	2.9	1.5	1.2	1.8	.3	(1)	(1)	.2	1.0	.3	.6
Vermont	.1	.5	.3	.2	.2	4.1	1.2	.6	1.1	(1)	(1)	.1	.4	1.4	.5	.6
Wyoming	.1	.6	.1	.3	.3	3.7	2.3	.5	1.4	.4	2.5	1.7	(1)	.5	.1	.4
Alaska	.1	.5	.1	.2	.1	2.8	1.3	.4	.9	.1	.4	.2	(1)	.1	.1	.2

(1) Less than 50 people.

Employment by census occupation and State, 1980—Continued

(Numbers in thousands)

	Precision production occupations—Continued					Machine operators and tenders, except precision						Fabricators, assemblers, and hand working occupations		Transportation and material moving occupations	
		Precision food production occupations												Motor vehicle operators	
	Electrical and electronic equipment assemblers	Butchers and meatcutters	Bakers	Inspectors, testers, and graders	Plant and system operators	Metalworking and plastic working machine operators	Metal and plastic processing machine operators	Woodworking machine operators	Printing machine operators	Textile, apparel, and furnishings machine operators	Machine operators, assorted materials	Welders and cutters	Assemblers	Production inspectors, testers, samplers, and weighers	Truckdrivers, heavy	Truckdrivers, light
United States	104.5	277.6	110.1	96.6	240.8	715.4	218.3	142.0	422.5	1487.5	2943.0	712.6	1459.3	825.0	1713.9	510.0
California	37.3	28.4	12.0	12.1	21.0	47.3	18.4	10.5	42.9	94.2	245.4	54.7	149.6	74.5	147.5	57.1
New York	4.5	19.9	10.9	6.3	15.2	40.7	11.2	4.6	40.6	128.0	194.4	26.0	95.5	47.6	80.5	40.1
Texas	8.3	16.1	5.5	6.1	22.8	25.4	7.7	5.0	21.8	67.8	143.9	68.4	71.2	40.1	128.2	41.2
Illinois	4.1	15.8	5.3	5.3	13.7	58.9	14.7	2.9	31.8	25.9	177.8	39.3	97.1	47.2	83.5	27.0
Pennsylvania	4.3	14.2	7.4	5.8	12.5	57.6	17.3	6.6	25.2	121.0	181.9	47.5	73.1	51.9	90.3	28.8
Ohio	2.2	11.9	5.6	4.8	11.3	80.7	21.5	5.1	23.3	26.5	182.2	43.7	102.4	56.4	83.3	26.0
Florida	2.9	10.7	4.7	3.4	8.3	6.9	3.3	3.2	12.8	41.5	74.2	17.4	32.5	16.9	68.5	18.9
Michigan	1.1	8.6	4.5	4.7	8.3	83.3	14.4	4.4	14.0	20.1	128.2	37.0	110.3	48.7	58.3	19.1
New Jersey	2.8	8.3	4.6	3.0	8.5	14.5	6.4	1.2	18.4	45.3	119.3	12.7	44.5	24.7	50.8	20.6
Massachusetts	4.7	5.4	4.4	4.3	4.8	19.1	8.9	2.3	14.5	44.6	87.0	10.3	47.6	27.0	29.7	13.8
North Carolina	1.2	6.8	1.9	2.2	4.6	15.8	5.2	12.1	8.4	170.5	122.1	14.2	42.8	42.9	55.9	11.7
Indiana	1.5	6.6	2.5	3.5	5.2	41.6	12.2	5.1	10.1	15.2	107.4	23.9	65.9	32.8	49.0	13.5
Virginia	.7	5.2	1.3	2.3	5.7	6.8	2.5	5.4	8.8	52.6	70.5	13.8	18.8	19.1	43.1	8.1
Georgia	.4	7.1	1.6	1.7	4.4	7.4	3.6	4.5	8.4	99.5	82.5	15.3	27.5	23.1	48.0	11.3
Wisconsin	2.6	6.5	2.7	2.0	4.1	32.9	8.5	4.8	11.6	14.9	85.2	21.4	48.3	21.5	40.8	9.9
Missouri	1.3	7.5	2.3	1.9	4.1	12.5	4.7	3.5	10.6	32.8	59.8	15.9	40.2	15.7	46.6	9.4
Maryland	1.0	5.1	2.2	1.5	6.3	5.0	2.2	1.0	11.6	14.0	41.6	7.8	17.3	8.3	29.6	7.4
Tennessee	.5	4.6	1.4	2.1	5.0	11.8	4.6	5.2	7.8	71.7	85.4	16.1	36.6	20.3	43.3	8.4
Minnesota	1.7	6.2	2.6	1.3	4.9	11.1	5.2	2.1	11.3	9.5	45.1	13.6	33.1	11.3	33.1	8.9
Washington	2.1	4.3	2.1	1.7	4.0	5.9	2.2	6.0	6.2	11.0	35.3	12.1	14.5	12.5	29.1	10.0
Louisiana	.2	3.6	1.6	.9	7.6	2.8	1.7	1.7	3.6	13.7	41.4	27.7	8.6	7.6	37.4	8.3
Alabama	.4	4.5	1.1	1.3	4.5	8.1	3.6	4.3	3.6	61.7	62.4	16.5	14.8	14.6	36.4	7.3
Connecticut	2.0	2.6	2.1	2.6	2.5	24.3	5.6	1.1	8.2	12.3	58.5	7.3	27.5	19.1	17.2	6.8
Kentucky	.4	3.8	1.1	1.0	3.6	10.8	3.2	3.2	5.6	29.2	50.0	13.2	30.6	12.7	35.0	8.0
Colorado	2.5	4.4	1.5	1.5	3.3	3.8	1.9	1.0	5.6	6.3	22.3	7.1	13.4	6.7	20.5	9.1
South Carolina	1.0	3.5	.6	1.3	3.6	6.5	3.0	2.2	4.0	92.2	65.0	9.8	13.9	20.3	25.0	4.3
Iowa	.6	10.7	1.7	.9	2.6	12.7	3.2	1.2	5.9	7.0	38.3	11.9	20.2	9.1	29.3	6.5
Oklahoma	.8	3.5	1.1	1.4	4.7	7.4	1.9	1.4	4.3	11.9	27.3	16.0	18.0	8.9	29.0	7.1
Oregon	1.5	2.7	1.5	.5	2.2	5.5	1.9	8.1	4.2	5.9	28.4	7.8	11.9	8.3	23.7	5.0
Arizona	3.3	2.5	1.2	1.8	2.5	3.9	1.8	.9	3.7	6.2	18.6	7.2	13.3	6.1	19.3	5.5
Kansas	.7	5.1	1.0	1.2	4.1	6.1	1.4	1.0	5.4	5.8	27.2	10.3	16.8	7.0	19.0	5.4
Mississippi	.3	3.5	.6	.7	2.3	4.0	1.4	4.0	2.1	34.4	36.4	10.1	17.2	9.0	24.8	4.3
Arkansas	.4	4.4	.7	.7	2.0	6.1	2.0	4.0	2.7	17.0	34.7	8.0	20.4	9.2	22.9	5.1
Nebraska	.2	5.6	.8	.5	1.7	2.6	.9	.4	2.5	4.1	15.6	5.9	7.8	3.4	14.7	3.7
West Virginia	.1	1.9	.5	.4	2.7	3.3	1.0	1.5	1.5	7.4	22.8	7.4	4.1	4.6	20.0	2.8
Utah	.9	1.4	1.0	.5	1.7	1.9	.9	.5	2.5	5.9	11.4	4.8	8.1	3.7	11.9	3.6
New Mexico	.7	1.4	.4	.4	1.8	.7	.3	.5	1.2	4.1	5.7	3.4	2.4	1.9	10.7	2.1
Maine	.5	1.6	.8	.3	1.2	2.4	1.0	2.3	1.3	18.8	17.9	3.4	4.9	5.0	8.5	3.0
New Hampshire	1.4	.9	.5	.8	.8	4.9	1.7	1.4	2.2	10.0	16.6	2.1	9.4	5.9	6.2	2.1
Rhode Island	.5	.9	.6	.3	.7	6.3	2.8	.3	2.1	8.5	21.6	3.0	10.4	6.1	5.3	2.7
Hawaii	(1)	1.1	.6	.1	.8	.2	.1	.2	1.0	3.1	5.1	2.0	.9	.8	4.9	2.4
Nevada	.2	.8	.4	.2	1.1	.6	.2	.2	1.1	1.7	4.1	1.5	1.7	.7	5.5	2.0
Idaho	.2	1.3	.5	.2	.7	.5	.5	1.8	.9	1.4	7.9	3.2	2.1	3.9	8.9	1.6
Montana	.1	1.1	.5	.1	.9	.6	.1	1.4	.8	1.2	3.6	2.0	.5	.8	7.3	1.5
District of Columbia	.1	.4	.3	.1	1.0	(1)	.1	(1)	1.7	1.8	2.6	.2	.4	.5	3.6	1.3
South Dakota	.3	2.1	.4	.1	.4	.5	.3	.3	.8	2.1	4.0	1.7	2.7	.9	6.4	1.7
North Dakota	.1	.7	.4	.1	.8	.4	.1	.1	.5	1.0	2.9	2.2	1.1	.5	5.9	1.3
Delaware	.1	1.1	.3	.2	.9	.6	.3	.1	.9	2.3	8.3	1.5	4.0	2.0	3.9	1.3
Vermont	.1	.6	.3	.3	.4	2.5	.7	1.2	1.4	2.3	8.8	.7	2.9	2.5	3.8	1.2
Wyoming	(1)	.5	.2	.1	1.6	.2	.1	.2	.5	.9	2.4	2.7	.4	.5	5.8	.9
Alaska	(1)	.4	.2	.1	1.1	.1	(1)	.2	.4	.5	2.1	.7	.1	.2	2.1	.7

(1) Less than 50 people.

Employment by census occupation and State, 1980—Continued

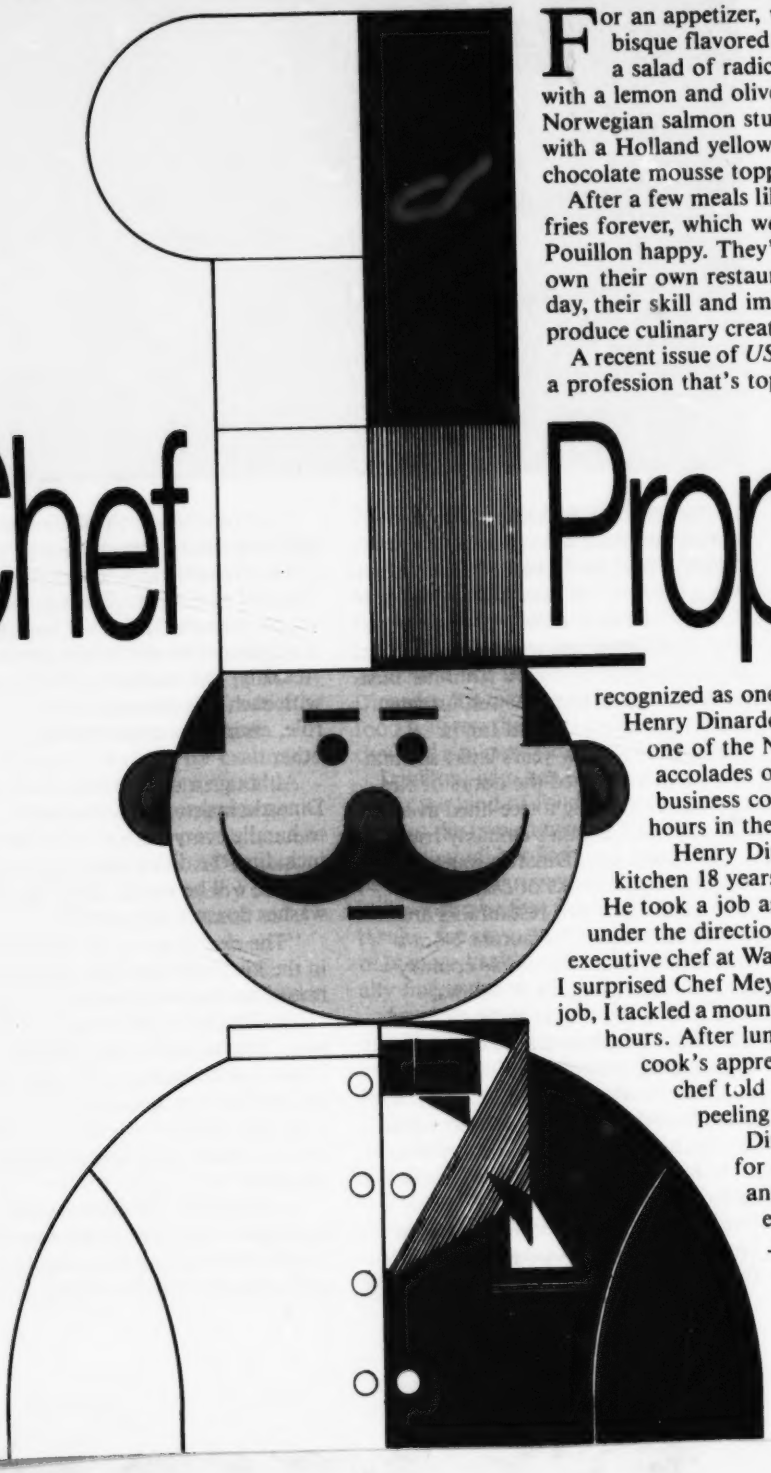
(Numbers in thousands)

State	Transportation and material moving occupations—Continued								
		Motor vehicle operators—Continued					Material moving equipment operators		
	Driver-sales workers	Bus drivers	Taxicab drivers and chauffeurs	Rail transportation occupations	Water transportation occupations	Operating engineers	Crane and tower operators	Industrial truck and tractor equipment operators	Handlers, equipment cleaners helpers, and laborers
United States	177.4	373.6	174.4	203.2	68.0	194.7	120.8	388.7	4384.9
California	16.5	34.3	17.9	9.9	5.4	17.3	5.5	37.6	407.7
New York	11.6	38.6	36.1	12.2	4.4	9.9	5.1	15.1	255.1
Texas	12.4	14.5	9.7	15.0	5.6	17.4	7.3	22.3	304.2
Illinois	7.7	19.9	10.5	16.3	1.7	7.4	8.4	22.8	243.1
Pennsylvania	10.3	20.6	7.0	14.2	1.6	9.0	15.5	23.8	271.2
Ohio	11.4	17.2	4.8	12.9	1.2	7.4	11.4	27.3	222.5
Florida	6.5	12.8	9.9	3.5	6.2	8.3	3.3	9.9	177.4
Michigan	7.9	16.4	5.6	6.5	1.0	5.9	5.7	24.0	142.3
New Jersey	5.6	14.5	5.8	3.7	2.5	4.0	2.5	13.8	134.3
Massachusetts	4.1	10.6	5.4	1.9	1.2	3.2	1.1	5.8	93.6
North Carolina	6.3	8.2	2.6	2.7	1.0	3.6	1.8	11.8	143.4
Indiana	4.3	7.4	1.8	7.8	.5	3.9	7.8	13.8	117.9
Virginia	3.8	12.1	5.0	4.2	1.6	6.0	2.4	7.4	110.8
Georgia	4.2	9.1	3.5	4.8	.7	4.6	1.8	14.6	122.6
Wisconsin	3.7	8.3	1.8	3.9	.5	2.9	2.8	11.9	94.3
Missouri	4.0	8.5	3.5	6.1	1.3	4.2	1.8	8.5	99.2
Maryland	3.4	10.1	5.6	3.2	1.2	3.5	2.9	5.6	84.3
Tennessee	3.9	6.4	2.0	4.3	1.2	3.4	2.4	10.4	106.1
Minnesota	3.3	8.8	1.9	3.9	.5	3.3	1.4	5.9	76.7
Washington	3.2	7.8	2.5	3.7	3.5	4.4	3.0	8.0	75.4
Louisiana	3.5	8.7	3.3	4.1	12.2	4.7	3.5	5.6	88.5
Alabama	3.0	5.2	1.2	4.2	1.6	4.0	3.5	8.8	93.5
Connecticut	2.6	4.6	1.7	.9	.5	2.0	1.1	2.9	44.1
Kentucky	3.3	6.3	1.5	5.7	1.3	4.4	1.9	7.3	70.6
Colorado	2.0	5.0	1.9	3.5	.1	4.6	1.1	3.6	53.3
South Carolina	2.9	3.7	1.6	1.9	.8	2.2	1.3	5.9	72.1
Iowa	2.7	4.6	1.0	3.5	.2	2.4	1.4	6.4	59.3
Oklahoma	2.6	3.8	1.7	1.8	.2	3.7	1.1	4.4	56.0
Oregon	1.8	4.8	1.2	2.5	.9	2.6	1.0	7.6	51.6
Arizona	1.4	3.5	1.3	2.1	.2	3.7	.8	2.4	47.6
Kansas	1.8	3.2	1.0	5.0	.1	3.2	.7	3.4	46.9
Mississippi	1.9	3.8	1.3	2.0	2.2	2.3	1.1	4.7	52.0
Arkansas	2.2	2.4	.8	2.7	1.0	2.3	.8	5.7	48.2
Nebraska	1.2	2.1	.7	4.4	.1	2.0	.4	2.1	33.1
West Virginia	1.2	3.5	1.1	4.4	.7	3.5	2.0	2.5	46.3
Utah	1.1	1.6	.3	2.6	.1	1.8	.9	1.9	24.7
New Mexico	.7	2.3	.7	1.2	.1	2.9	.3	.9	23.7
Maine	.8	2.1	.4	.7	.6	.9	.6	1.8	22.5
New Hampshire	.8	1.3	.6	.2	.1	.8	.3	1.2	17.1
Rhode Island	.8	1.7	.5	.1	.3	.4	.3	1.0	16.4
Hawaii	.5	2.0	1.3	(1)	.6	1.2	.5	1.1	18.0
Nevada	.5	1.3	1.8	.8	.1	1.2	.2	.8	14.4
Idaho	.7	1.5	.2	1.3	(1)	1.2	.4	1.8	17.7
Montana	.6	1.2	.3	2.0	.1	1.4	.4	.9	15.0
District of Columbia	.3	1.4	2.4	.1	(1)	.2	.1	.4	10.3
South Dakota	.4	1.0	.2	.5	(1)	.9	.1	.6	11.8
North Dakota	.5	.9	.1	1.3	(1)	.9	.2	.4	10.4
Delaware	.4	1.6	.3	.5	.3	.6	.3	.9	11.9
Vermont	.5	.8	.3	.2	.1	.5	.1	.5	7.8
Wyoming	.3	.7	.1	2.2	(1)	1.5	.3	.5	10.5
Alaska	.1	.7	.4	.2	.5	1.0	.1	.4	7.4

(1) Less than 50 people.

You're a **What?**

by Michael Stanton



Chef Proprietaire

For an appetizer, why not start with a bowl of Iowa corn bisque flavored with Maryland lump crab meat? Then a salad of radicchio, Belgian endive, and goat cheese with a lemon and olive oil dressing. Dinner will be grilled Norwegian salmon stuffed with Maine lobster and covered with a Holland yellow pepper sauce. And for dessert, chocolate mousse topped with hazelnut sauce.

After a few meals like this, you might forsake burgers and fries forever, which would make Henry Dinardo and Nora Pouillon happy. They're the *chefs proprietaires*—chefs who own their own restaurant—responsible for our repast. Every day, their skill and imagination are joined in their kitchens to produce culinary creations that are winning national renown.

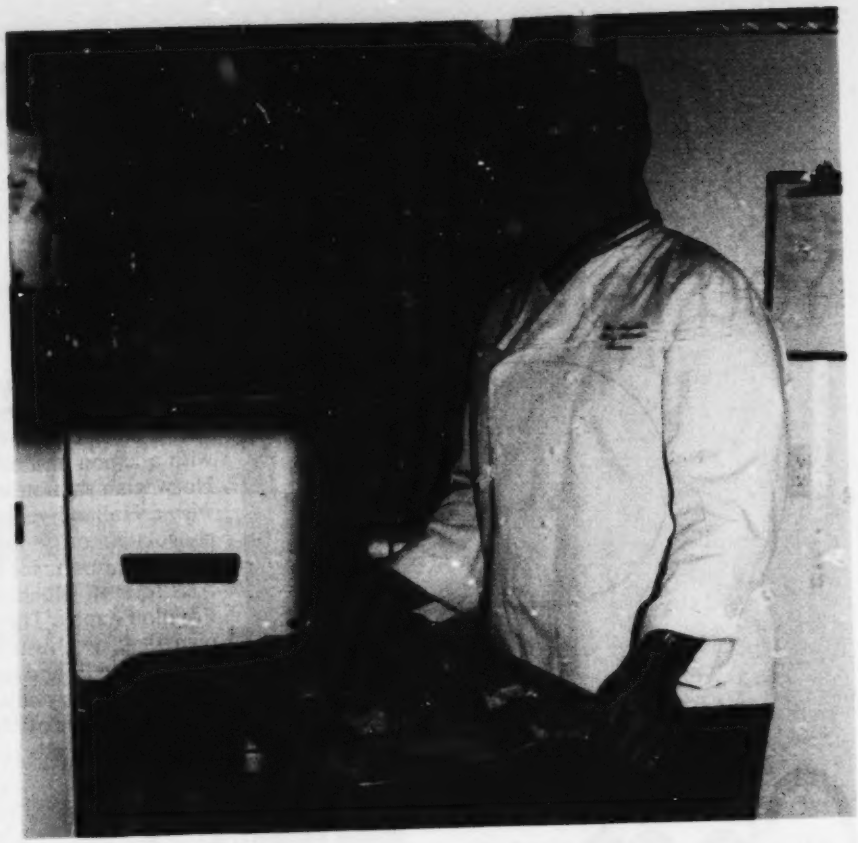
A recent issue of *USA Today* praised both of these chefs. In a profession that's topheavy with men, Nora Pouillon was recognized as one of the country's leading chefs. And Henry Dinardo's restaurant, Windows, was dubbed one of the Nation's best. They did not earn these accolades overnight. Success in the restaurant business comes only after many long, hot, hard hours in the kitchen.

Henry Dinardo first stepped into a professional kitchen 18 years before opening his own establishment. He took a job as a potwasher in a Florida restaurant under the direction of Chef Walter Meyer, now the executive chef at Walt Disney World's Epcot Center. "I think I surprised Chef Meyer," he says, "The first morning on the job, I tackled a mountain of pots and had them cleaned in a few hours. After lunch, he asked me if I'd like to become a cook's apprentice, which meant I did anything the chef told me to do, from mopping floors to peeling potatoes."

Dinardo worked in Chef Meyer's kitchen for a year and a half, learning all he could and developing an appreciation for an essential ingredient in any restaurant—

Michael Stanton is the OOQ's staff writer.

Chef Proprietaire



discipline. Says Dinardo, "All fine restaurants have organized, disciplined kitchens. The restaurant business is a tough, competitive one. One out of two fails. If you're complacent, you'll soon be out of business."

After serving his apprenticeship with Chef Meyer, Dinardo became the chef at another Florida restaurant, a position, he concedes, that was probably beyond his experience. "I've always been a go-getter." The new restaurant, a smorgasbord in Deerfield Beach, served from 750 to 1,000 dinners a day. The discipline that he learned has served him well. The next-to-last step before setting out on his own was the chef's job in the Tower Room in the Boca Raton Hotel and Club, a four-star resort on Florida's Atlantic coast.

Austrian-born Nora Pouillon came to this country in the mid-1960's, bringing with her a knowledge of fine food and a love of cooking. With her homeland situated at Europe's crossroads, she sampled a variety of continental styles and flavors. She remembers growing up in a family where every meal was an event, saying, "My mother prepared three-course meals twice a day every day. Everything was fresh. I never saw packaged foods until I moved to the States."

With her accent still strong despite two decades in America, Pouillon contrasts her background with Dinardo's. "I am an *autodidact,* or self-taught, chef. When I came to this country, I started to read a lot about food, experimenting and creating in my own kitchen." While Dinardo had Chef Meyer as a mentor, Pouillon was influenced by the authors she read, especially Elizabeth David, Julia Child, and James Beard.

Pouillon settled in Washington, where, before long, she transformed her culinary hobby into a career. "I loved to cook and entertain." Friends began asking her to cater their parties. She started her own catering company, called "Food for Friends." Her business was a success, but after a few years she decided that she needed new challenges. The logical step was a restaurant. With an established reputation from her business, she was offered the restaurant concession at the Tabard Inn in Washington. A few years later, she and two partners opened the doors of Restaurant Nora along a tree-lined avenue close by Washington's embassy row.

Two years ago, Dinardo joined Pouillon in the ranks of *chefs proprietaires*. Their two restaurants are contrasts in style. Restaurant Nora's ambience is that of a simple country inn; Dinardo's elegant Windows, located in a skyscraper on the Virginia side of the Potomac River, offers a breathtaking panorama of the capital city. But in one important respect, they are alike—the daily fare at each would satisfy the most discerning gourmet.

At each restaurant, the days begin early. Dinardo is at work by 7 a.m., Pouillon not long after. Preparations are soon underway—potatoes peeled, fish filleted, and sauces prepared.

Both have staffs to watch over. As executive chefs, Pouillon and Dinardo are in overall charge; but, says Dinardo, "A chef can't do everything. Many people assume that a chef handles every dish that comes out of the kitchen. Actually, I'm managing 20 to 30 people, with each one playing an important role, each one complementing the other."

Although a chef cannot do it all, Dinardo insists that a chef must be able to handle every station in the kitchen, including the dishwasher's, because "There will be nights when the dishwasher doesn't show up."

"The chef is a mentor for everybody in the kitchen," says Pouillon, "so you must know how to manage people." "Technically," adds Dinardo, "you can be an excellent chef; but, if you don't know how to manage your staff—giving praise when it's deserved and a push when it's needed—you're in trouble. I want my hard work and discipline to be emulated by my staff."

At Windows, the staff includes two sous chefs, who run the kitchen when the chef is absent; a first cook; a second cook; a pastry chef; and a *garde*

manger, who is in charge of the cold station where salads and cold appetizers are prepared. Numerous assistants and helpers round out the kitchen personnel.

The staff at Restaurant Nora is not as large, but it functions in a similar way. Pouillon adds that each station in the kitchen has its own personality, which requires certain characteristics and traits. "The salad station, for example, requires someone who is artistic, but also fast. Presentation and service go hand-in-hand in a restaurant. You need someone who can turn out an artistic plate and do it quickly. A pastry chef, though, must be very patient and extremely exact and have a very good sense of beauty and balance."

As chefs of restaurants that are in the public eye and attract the regular scrutiny of the critics, Pouillon and Dinardo must offer a menu that is not only of consistently high quality but also creative. "I try new dishes and recipes all the time," says Dinardo. "You can't afford to become complacent in such a competitive business."

They must also know their suppliers. Each restaurant changes its menu frequently and serves fairly exotic fare, so Pouillon and Dinardo must keep up good relations with the purveyors who can supply what they need. Finding someone who can quickly provide Belgian endive, yellow peppers from Holland, or raspberries from New Zealand is not always easy. Says Dinardo, "It takes time locating good food sources; the relationship between a chef and a purveyor is an important one."

Pouillon, who has very exact ideas about the kind of food she serves, also stresses the importance of suppliers. She insists that all her fruit and vegetables be organically grown and that her meat and poultry be free from additives. The results, she says, are foods that are not only more healthful but also exceptionally fine textured and full flavored.

As *chefs proprietaires,* both Pouillon and Dinardo have responsibilities that extend beyond the kitchen. They must keep a keen eye on the balance sheets. "These responsibilities consume almost as much time as the kitchen," says Pouillon. "Not only do you have to know that it is Thursday and the fish is coming, but that it is Thursday and the quarterly income tax must be paid," adds Dinardo.

Both chefs agree that, as with any job, there are disadvantages and frustrations. One that is readily mentioned is the time required to run a restaurant. For Dinardo, 75- to 80-hour weeks are not unusual. Pouillon's schedule has eased a bit in the last few years, but she too acknowledges that 14- and 16-hour days were common when the business first got underway. "If you're the kind of person who wants a regular schedule, don't think about becoming a chef," she says.

Working in a kitchen is also very demanding physically. "The work is hot and heavy," says Dinardo. "When you're working the line during dinner, expect to be on your feet all night."

Aside from time and labor, certain innate skills are essential for a chef. "Naturally," says Dinardo, "your senses must be well developed." Pouillon says, "My staff probably wishes my nose weren't so good. I can walk into the kitchen and tell you what was burning."

Training for chefs comes in many forms. Over the last decade or so, culinary schools have risen up all over the country. The success of Pouillon and Dinardo, however, demonstrates that school-based programs are not the only way to learn the business. And both of these chefs now have apprentices working in their kitchens.

"I would love to see more young, career-minded people step into the kitchen," says Dinardo. "In Europe, you do your apprenticeship in major hotels, get valuable experience, and receive room and board at the same time. Economically, that is not really feasible here; but you must get some experience. One fellow worked with me for 3 years and then went to a culinary school; he had a big leg up on the other students. At any rate, the key to success in the kitchen is not in a diploma; it's in the dishes you prepare." OOQ

New From NOICC

The National Occupational Information Coordinating Committee (NOICC) has developed a text for college courses in career development for counselors-in-training. Called *Using Labor Market Information in Career Exploration and Decision Making: A Resource Guide*, the book's authors include Norman Gybsers, Harold Goldstein, Robert Bhaerman, and Carl McDaniels. Six chapters cover a wide range of topics:

- Understanding career development and the use of career and labor market information in career counseling
- Understanding the labor market
- Exploring labor market information sources and systems
- Exploring labor market information resources and products
- Using labor market information in career counseling
- Developing a professional plan of action

Each chapter includes suggested activities for instruction and for personal development.

Using Labor Market Information is available from the publisher, Garrett Park Press, P.O. Box 190F, Garrett Park, MD 20896. Price: $14 prepaid; $15 billed. Orders from individuals should be prepaid. Orders from institutions should follow normal purchasing procedures.

Reprints Available

Reprints of four popular articles that originally appeared in the *OOQ* have been published by the Government Printing Office (price in parentheses):

- The Job Outlook in Brief, 1984-95 ($1.50)
- Outlook for College Graduates and Ph.D.'s ($1.00)
- Matching Yourself With the World Work, 1986 Edition ($1.00)
- Opportunities in Franchising ($1.00)

You may deduct 25 percent off the price when ordering 100 or more copies of the same title. Payment may be made in three ways: By check or money order made payable to the Superintendent of Documents, charge to GPO Account, or charge to either MasterCard or VISA account. Orders may be sent to any of the following three addresses.

Bureau of Labor Statistics
Publications Sales Center
P.O. Box 2145
Chicago, IL 60690

S.M. Woods
Consumer Information Center
Pueblo, CO 81009

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

Index Coming Next Issue

The Statement of Ownership and the news about the new, lower price for the *Quarterly* have used up the space we intended to devote to an index of articles. The index for 1982-86 will appear in the spring issue. OOQ

U.S. Postal Service **Statement of Ownership, Management and Circulation** *(Required by 39 U.S.C. 3685)*

1. Title of publication	Occupational Outlook Quarterly
2. Date of filing	10/86
3. Frequency of issue	Quarterly
4. Annual subscription price	$5
5. Location of known office of publisher	441 G Street, N.W. Washington, D.C. 20212
6. Location of headquarters of general business office of publisher	(same address as above)
7. A. Name and address of publisher	U.S. Department of Labor Bureau of Labor Statistics (same address as above)
7. B. Name and address of editor	Melvin Fountain (same address as above)
7. C. Name and address of managing editor	Neale Baxter (same address as above)
8. Owner	U.S. Department of Labor Bureau of Labor Statistics (same address as above)
9. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities	None

10. Extent and nature of circulation	Average no. copies each issue during preceding 12 months	Actual no. copies single issue published nearest to filing date
A. Total no. copies (net press run)	21,147	21,147
B. Paid or requested circulation:		
1. Sales through dealers and carriers, street vendors, and counter sales	1,900	2,000
2. Mail subscriptions	17,243	17,143
C. Total paid circulation	19,143	19,143
D. Free distribution by mail, carrier or other means (samples, complimentary and other free copies)	1,904	1,904
E. Total distribution	21,047	21,047
F. Copies not distributed:		
1. Office use, left over, unaccounted, spoiled after printing	100	100
2. Returns from news agents	NA	NA
G. Total (sum of E, F1 and 2—should equal net press run shown in A)	21,147	21,147

I certify that the statements made by me above are correct and complete.

Melvin Fountain (Editor)

1-year OOQ subscription

~~$11~~

Now $5

—and 2-year subscriptions are also available!

It's true! The cost of a subscription to the OOQ has been cut in half because of a new pricing policy by the U.S. Government Printing Office. And now 2-year subscriptions are available for the first time ($10). So take your pick—half the price or twice the issues. Either way, you get the latest authoritative information on emerging occupations, new technology, labor force trends, and occupational outlook. Act now!

See ordering information on inside front cover of this issue.

U.S. Department of Labor
Bureau of Labor Statistics
Washington, D.C. 20212

Official Business
Penalty for Private Use, $300

Second Class Mail
Postage and Fees Paid
U.S. Department of Labor
ISSN 0199-4786